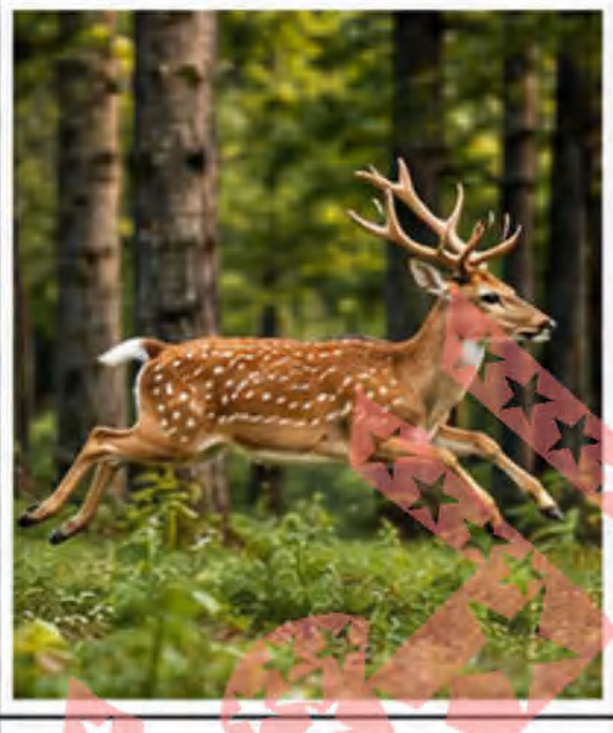
1-1 Search about living organisms | Exercises and Evaluations

First: Class Activity (10 Marks)

* **Discover living organisms from non-living things:**
Living organisms differ from non-living things, such as rocks and water.
They need **food**, **grow**, and **reproduce**.

* **Look at the pictures below. Put a tick (✓) under the living organisms and a cross (✕) under the non-living things, and write your classification underneath each image:**

Turnip	Deer	Door	Dolphin
			
(✓) Living Organism (Plant)	(✓) Living Organism (Animal)	(✕) Non-Living Thing	(✓) Living Organism (Animal)

In the light of your classification, answer:

1. **Living organisms are distinguished from non-living things by characteristics such as Nutrition, Respiration, and Growth.** (6 Marks)

2. **Rocks and the wooden door (or water/air) are considered non-living things.** (4 Marks)

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Learning Journey - Habitat and Adaptations

Learning Journey (10 Marks)

★ Look at the pictures and then choose the correct answer:

1 Which of the following habitats is suitable for a fish to live in?

(A) Seas and rivers ⇐ Correct Answer
(B) Dry desert
(C) Under rocks
(D) Inside burrows

2 What does a tree provide for a sparrow?

(A) A suitable habitat ⇐ Correct Answer
(B) Food
(C) Water
(D) Air

3 Why do some animals hide in burrows during hot weather?

(A) To get food
(B) To take shelter from the sun's heat ⇐ Correct Answer
(C) To be exposed to direct sunlight
(D) To get water

4 What does a flower provide for a bee?

(A) Protection
(B) Food ⇐ Correct Answer
(C) Water
(D) Suitable temperature

Written Questions

5 Mention two needs that a habitat provides for an organism, and what would happen if we took a rabbit to live in the hot desert with a camel?

- Two needs provided by the habitat: 1. Food and 2. Water (or Shelter / Air). (2 Marks)
- What would happen to the rabbit: The rabbit cannot tolerate the extremely high temperature and lack of water in the desert because it lacks the physical and behavioral adaptations to live there, which will lead to its death. (2 Marks)

6 How do living organisms live in hot and dry places?

Answer: They live by using special behavioral adaptations, such as hiding in moist underground burrows or under rocks during the daytime and being active at night, and having special body structures to retain water. (2 Marks)

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

The Small Scientist (10 Marks)

*** Use the observation card to record your observations about the following organism:**

Observation Card (A)

Organism name:	**Wasp (or Bee)**		
Date: August 2026	**Class:** Grade 4	**Name:** [Teacher Copy]	
Shape:	Body divided into 3 parts (head, thorax, abdomen), having 6 legs, antennae, and two pairs of wings.		
Color:	Yellow and Black stripes		
Habitat:	Garden beds and flowering plants in the school yard.		
Notes:	Flies actively and moves from flower to flower to get food.		

*** Use the observation card to record your observations about the following organism:**

Observation Card (B)

Organism name:	**Lizard**		
Date: August 2026	**Class:** Grade 4	**Name:** [Teacher Copy]	
Shape:	Elongated body covered with scales, has 4 legs with claws, and a long tail.		
Color:	Dark Black or Grey		
Habitat:	On rocks or under rock crevices in hot, dry environments.		
Notes:	Stays still on the rock to regulate its body temperature.		

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Homework Assignments | Exercises and Evaluations

Homework (10 Marks)

1 Complete: (2 Marks)

(a) Rocks, soil and water found in the school yard are classified as non-living things.

(b) The place where a living organism lives and finds its needs is called the habitat.

2 How do you examine a leaf from the willow tree with a magnifying glass? (2 Marks)

Answer: I place the leaf under suitable, good light, hold the magnifying glass close to my eye, and slowly move the leaf closer or further away until its fine network of veins and details are highly magnified and perfectly visible.

3 Explain: The cat is considered to be a living organism. (2 Marks)

Answer: Because it performs all vital life processes necessary for survival such as: nutrition, respiration, growth, movement, sensation, and reproduction.

4 What are the most important characteristics that distinguish the places under the rocks? (2 Marks)

Answer: These places are dark, moist, and cool compared to the external environment, which provides an ideal shelter to protect small organisms from the sun's direct heat and dryness.

5 Explain how we use the magnifying glass in examining a giant rock. (2 Marks)

Answer: I stand firmly in front of the giant rock, hold the magnifying glass close to my eye, and slowly approach the rock's surface to focus and magnify the fine cracks, textures, and crystals.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Groups A & B) | Our Environment

Group (A) [5 Marks]

1 Complete the following sentence: When preparing an observation record card, you first write **the organism name.** (1 Mark)

2 State the reason: Some living organisms prefer to live close to grass and trees. (1 Mark)
Answer: To find food, water, shade, and suitable shelter, and to protect themselves from predators and direct sunlight.

3 Give an example of a living organism that lives near flower beds. (1 Mark)
Answer: Bees (or butterflies).

4 Correct the following statement: The pigeon resorts to living in burrows or under rocks away from sunlight. (1 Mark)
Correction: Lizards (or desert rodents / jerboas) resort to living in burrows or under rocks away from sunlight.

5 What are the characteristics that distinguish living organisms from non-living things? (1 Mark)
Answer: The ability to perform vital life processes such as: nutrition, respiration, growth, movement, reproduction, and sensation.

Group (B) [5 Marks]

1 Complete the following sentence: Plants and animals are examples of living organisms. (1 Mark)

2 Explain the following: The types of living organisms you find differ depending on the location. (1 Mark)
Answer: Because each living organism has unique physical and behavioral adaptations that match a specific habitat to meet its food, water, and shelter needs.

3 Give an example of a living organism that lives under rocks or in the shadows of stones. (1 Mark)
Answer: Ants (or earthworms / lizards).

4 Correct the following statement: You must write your favorite clothing colors at the beginning of the observation record card. (1 Mark)
Correction: You must write the organism name and the observation date at the beginning of the observation record card.

5 Mention three basic elements that you record on the observation record card when observing a living organism. (1 Mark)
Answer: 1. Organism name | 2. Color and Shape | 3. Location and Notes.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Weekly Assessment: Week 1 (Group C) | Our Environment

Group (C) [10 Marks]

1 1. Complete the following sentence: The place where a living organism lives is called **the habitat.** (2 Marks)

2 2. State the reason: Some living organisms prefer to live near dense grass. (2 Marks)

Answer: To find abundant food (especially for herbivores), shelter, shade, and protection from predators and intense solar heat.

3 3. Mention how a magnifying glass is used to examine the willow tree. (2 Marks)

Answer: Stand next to the tree, hold the magnifying glass close to your eye, and slowly approach the leaves and branches to focus and magnify the fine network of veins clearly.

4 4. Correct the following statement: When drawing the organism you observe on the observation record card, you should use thick and heavy lines. (2 Marks)

Correction: When drawing the organism you observe on the observation record card, you should use thin and simple lines to accurately represent scientific details.

5 5. What is your opinion on the following action: Looking directly at the hot sun with a magnifying glass? Give a scientific reason. (2 Marks)

Answer: It is extremely dangerous and wrong; because the magnifying glass concentrates and focuses the hot solar rays directly onto the eye's retina, causing immediate damage and blindness.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

1-3 Colors and Shapes of Living Organisms | Class Activity

First: Class Activity (10 Marks)

*** Classifying Organisms:**
Living organisms can be classified into groups by observing their characteristics, such as colors, shapes, and sizes, to find similarities and differences.

*** Observe the nine living organisms below, classify them using different criteria, and record your observations in the table:**

1. Kingfisher	2. Tree Frog	3. Bengal Tiger
4. Macaw Parrot	5. Emperor Penguin	6. Mandarin Fish
7. Monarch Butterfly	8. Elephant	9. Praying Mantis

(A) Classify the nine living organisms in the table below according to different criteria: (6 Marks)

Classification Rules	Classified Groups (Model Answers in Elegant Red)
By Color	- Bright / Colorful Organisms: Kingfisher, Tree Frog, Macaw Parrot, Mandarin Fish, Monarch Butterfly - Dull / Camouflaged Organisms: Bengal Tiger, Emperor Penguin, Elephant, Praying Mantis
By Shape	- Organisms with wings (flying): Kingfisher, Macaw Parrot, Monarch Butterfly - Organisms with four legs: Bengal Tiger, Tree Frog, Elephant - Organisms with no legs (fins): Mandarin Fish - Organisms with six legs (insects): Praying Mantis
By Size	- Very Large Organisms: Elephant, Bengal Tiger - Medium-Sized Organisms: Emperor Penguin, Macaw Parrot, Kingfisher - Small Organisms: Tree Frog, Monarch Butterfly, Praying Mantis

(B) Answer the following analytical question: (4 Marks)

- **Why do scientists and students classify living organisms into groups?**
  Answer: To make the study, identification, and understanding of diverse living organisms easier, and to find the common characteristics and relationships between different groups.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Learning Journey: Suitable Habitats

Every living organism has a specific habitat that suits its physical and behavioral characteristics.

Observe the pictures of the living organisms below, then write their **suitable habitat** (on the banks of the Nile / the Desert) and the characteristics of each habitat: **(6 Marks)**

Living Organism	Suitable Habitat	Characteristics of the Natural Habitat (Model Answers in Red)
A purple lotus flower floating on flat green leaves	On the banks of the Nile	Shallow, fresh water, fertile wet clay soil, and direct sun exposure.
A wild waterfowl standing on the moist shore of Nile	On the banks of the Nile	Abundant fresh water, wet mud/clay soil, and rich vegetation.
An acacia tree with thorns standing in a dry sandy basin	The Desert	Extremely hot and dry climate, severe water scarcity, and sandy soil.

Second: Homework Assignment (4 Marks)

1. **Complete the following sentence: (1 Mark)**
   - A change in body parts (structural) or behavior that helps a living organism survive in its environment is called **adaptation.**
2. **Explain/Give Reason: Desert plants (such as the Acacia tree) have small-sized leaves. (1 Mark)**
   Answer: To reduce water loss by transpiration under the extreme heat of the desert sun and to conserve water.
3. **Give an example of: (1.5 Marks)**
   - **a.** An animal that lives on the banks of the Nile: **The Egyptian Goose (or Hippopotamus / Nile Crocodile).**
   - **b.** A plant whose habitat is the desert: **The Acacia tree (or Cactus / prickly pear).**
   - **c.** Birds that need an environment with abundant water and wet soil: **Waterfowl / The Egyptian Goose (or Herons).**
4. **What would happen if: The Acacia tree had short roots that are close to the soil surface? (0.5 Marks)**
   Answer: It would not be able to reach the deep underground water reservoirs, leading to its dehydration and failure to survive in the dry desert.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Homework Q5 & Weekly Assessment (Group A) | Exercises and Evaluations

Homework Assignment: Continued (2 Marks)

5 What happens when: A living organism is placed in an environment that does not suit its basic needs? (2 Marks)

Answer: It will not be able to obtain its basic needs of food, water, or shelter, which will lead to its death, or it will have to migrate to another suitable environment.

Third: Weekly Assessment - Group (A) (8 Marks)

1 Complete the following sentence: (1.5 Marks)

- The habitat of the Nile banks is characterized by having fertile / clay soil and abundant fresh water.

2 State the reason (Explain): The roots of the Acacia tree grow very deeply under the ground. (1.5 Marks)

Answer: To reach the deep underground water reservoirs located up to 35 meters below the dry desert soil surface.

3 What is meant by "Classification"? (1.5 Marks)

Answer: Grouping living organisms into categories based on their similarities and differences (such as color, shape, and size) to make studying and identifying them easier.

4 What would happen if: A desert Jerboa is moved to live in an environment with abundant water like the banks of the Nile? (1.5 Marks)

Answer: It may struggle to survive or escape predators because its body and behavior are adapted to dry, hot deserts, and its burrowing habits do not suit wet clay soils.

5 Compare between: The Desert habitat and the Nile banks habitat in terms of water abundance: (2 Marks)

- Desert Habitat: Extreme water scarcity / Rare rainfall.
- Nile Banks Habitat: Abundant, continuous fresh water.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Weekly Assessment: Groups B & C | Exercises and Evaluations

Weekly Assessment: Groups B & C (10 Marks)

Weekly Assessment: Group (B) (5 Marks)

1 Complete the following sentence: (1 Mark)
- The Fennec fox and Jerboa are classified as animals adapted to live in a **desert** environment.

2 State the reason (Explain): Animals and plants possess special structural and behavioral characteristics called "Adaptation". (1 Mark)
Answer: To help them adapt to their specific natural habitat, obtain food and water, seek shelter, and survive.

3 What is meant by "Adaptation"? (1 Mark)
Answer: A change in body parts (structural) or behavior that helps a living organism survive and reproduce in its environment.

4 What would happen if: An orange tree is planted in a dry, hot desert environment with little water? (1 Mark)
Answer: It will dry up, wilt, and die because it lacks the desert adaptations (such as water-saving leaves and specialized roots) to withstand extreme drought.

5 Explain briefly: The steps of classifying living organisms. (1 Mark)
Answer:
1. Observe and record the characteristics (color, shape, size).
2. Identify similarities and differences.
3. Group similar organisms together under defined criteria.

Weekly Assessment: Group (C) (5 Marks)

1 Complete the following sentence: (1 Mark)
- A plant that grows in abundant water and wet clay soil is the **Water Lily (Lotus).**

2 State the reason (Explain): Frogs and waterfowl (birds) cannot live in the middle of a dry desert. (1 Mark)
Answer: Because they require abundant fresh water and moist clay soils to survive, breathe (frogs via moist skin), and feed, which are absent in dry deserts.

3 What adaptations helped the Acacia tree survive in the dry desert environment? (1 Mark)
Answer: Small leaves to reduce transpiration, sharp thorns to repel herbivores, and a deep taproot (growing up to 35m) to extract deep groundwater.

4 Classify the following organisms in two different ways: (1 Mark)
(Lotus - Acacia - Fennec Fox - Frog)
* Way 1 (By Habitat): Nile Banks: (Lotus, Frog) | Desert: (Acacia, Fennec Fox).
* Way 2 (By Type): Plants: (Lotus, Acacia) | Animals: (Fennec Fox, Frog).

5 Compare between: The Desert habitat and the Nile banks habitat in terms of soil dryness: (1 Mark)
* Desert Habitat: Highly dry sandy soil (retains no water).
* Nile Banks Habitat: Wet and moist clay soil (retains water).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

1-5 Desert Organisms | Class Activity: The Right Organism in the Right Place

First: Class Activity - Desert Organisms

* **In the deserts of Egypt, living organisms possess physical characteristics and behavioral ways of life that help them adapt to the harsh, extreme environment.**
* **Complete the following table: (6 Marks)**

Desert Organism	Physical / Behavioral Adaptation	Reason / Scientific Benefit (Answer in Ruby Red)
Lesser Egyptian Jerboa hopping on sand	• Long, powerful hind legs. • Padded paws covered with thick hair.	• To leap in rapid, consecutive hops to escape from predators. • To grip the loose, slippery sand dunes and move with ease.
Fennec Fox resting in a cool sandy burrow	• Extraordinarily large and wide ears. • Thick fur covering the paws' soles.	• To radiate and lose excess body heat to cool down its body. • To protect its feet from the scorching heat of the desert sand.

Designing a Modern Desert Shoe (4 Marks)

* **Imagine you are an engineer designing a "Modern Desert Shoe" for explorers in Egyptian deserts. Inspired by the fennec fox's padded paw and the jerboa's hind legs, describe two features of your shoe design to help explorers tolerate the heat and move easily:**

1. **Feature One (Inspired by the bottom of the Fennec Fox's paw):**

Design: Adding a thick, thermally insulated bottom sole lined with padded textured fabric.

Benefit: To protect the explorer's feet from the scorching sand heat and prevent slipping on dunes.

2. **Feature Two (Inspired by the Jerboa's powerful hind legs):**

Design: Integrating a highly flexible, springy cushion heel system in the back of the shoe.

Benefit: To help the explorer hop and leap with minimal effort and bounce quickly across sandy terrain.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Second: Homework Assignments | Desert Adaptations

Second: Homework (10 Marks)

1 Complete: (2 Marks)

- The thick fur on the bottom of the fennec fox's paws helps it to walk on the hot desert sand without burning its feet, and muffles its footsteps while hunting prey.

2 Explain: (2 Marks)

- Many desert animals are active at night and hide in cool burrows during the day.

Answer: To escape the scorching daytime heat of the sun, keep their bodies moist, and prevent critical dehydration.

3 Give an example of: (2 Marks)

- A desert animal that rarely drinks water and gets most of its water needs from its food.

Answer: The Lesser Egyptian Jerboa (which extracts moisture from plants, desert seeds, and prey).

4 What happens if: (2 Marks)

- The hind legs of the jerboa are very short?

Answer: It would not be able to leap in long, rapid consecutive hops, making it extremely difficult to move fast on loose sand or escape from predators.

5 Mention the importance of each of the following: (2 Marks)

(A) The large ears of the Fennec Fox:

Answer: Radiating excess body heat to cool its body down, and providing exceptional hearing to locate insect prey underground.

(B) Desert organisms possessing special physical characteristics:

Answer: Enabling them to adapt, survive, find food and water, and avoid predators in the harsh, dry, and hot desert environment.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Group (A) [5 Marks]

1. Choose the correct answer: (1 Mark)
One of the **physical characteristics** that help the **jerboa** adapt in the **desert** is the presence of .....
(A) small ears.
(B) long hind legs. ⇐ Correct Answer
(C) thick fur on the face.
(D) storing water inside its hump.

2. Give reason: **Fennec fox** has extraordinarily large ears and fur covering its paws. (1 Mark)
Large ears radiate body heat to cool itself, and paw fur protects its feet from the scorching sand.

3. Give an example of: A smart behavior or trick **desert** animals use to avoid the extreme heat of the sun. (1 Mark)
Hiding in cool underground burrows during the daytime and becoming active at night.

4. What happens if: The paws of the **fennec fox** lack thick fur on their soles while walking on hot sand? (1 Mark)
Its feet would suffer severe burns from the scorching sand, and its movements would make noise, alerting prey.

5. Compare between: Jerboa and **Fennec Fox** (in terms of ear size): (1 Mark)

Animal	Ear Size (Answer in Ruby Red)
Jerboa	Relatively small, rounded ears.
Fennec Fox	Extraordinarily large, wide ears.

Group (B) [5 Marks]

1. Choose the correct answer: (1 Mark)
Desert animals hide in cool burrows under the ground during the day to:
(A) hunt and look for food.
(B) escape from the sun's extreme heat and keep their bodies moist. ⇐ Correct Answer
(C) compete with other animals for shelter.
(D) train on rapid jumping.

2. Give reason: The hind legs of the **jerboa** are characterized by being long. (1 Mark)
To enable it to leap in long, rapid, and consecutive hops to move quickly and escape danger.

3. Give an example of: A living organism that can live in the **desert** relying on the water present in its food. (1 Mark)
The Lesser Egyptian Jerboa (or Fennec Fox)

4. What happens if: **Desert** organisms in **Egyptian deserts** do not possess any physical or behavioral **adaptations**? (1 Mark)
They would be unable to tolerate the extreme heat and severe water scarcity, leading to their death and eventual extinction.

5. Compare between: Jerboa and **Fennec Fox** (in terms of leg characteristics): (1 Mark)

Animal	Leg Characteristics (Answer in Ruby Red)
Jerboa	Long, powerful hind legs and padded paws with sensory hairs.
Fennec Fox	Short, highly agile legs suited for swift running on sand.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Group (C) [10 Marks]

1 1. Choose the correct answer: (2 Marks)

- The **jerboa** gets most of its **water** needs, despite rarely drinking, by:

(A) eating plants and seeds that contain moisture. ⟸ **Correct Answer**

(B) collecting rainwater that accumulates in underground burrows.

(C) drinking a large amount of water at once and storing it inside its body.

(D) migrating daily to oases and water sources.

2 2. Give reason: (2 Marks)

- The **jerboa** leaps in rapid, consecutive hops when moving over hot desert sand.

Answer: **To minimize contact time with the hot sand, avoid sinking, and escape danger in a fast, unpredictable zigzag path.**

3 3. Give an example of: (2 Marks)

- A physical trait that helps the **fennec fox** cool its body and release excess heat.

Answer: **Extraordinarily large and wide ears.**

4 4. What happens if: (2 Marks)

- Desert animals go out to wander and search for food during the noon instead of the night?

Answer: **They would be exposed to scorching solar heat and extreme dryness, leading to severe dehydration, exhaustion, and death.**

5 5. Compare between: (2 Marks)

- The ears of a **Forest Fox** and the ears of a **Fennec Fox** (in terms of size):

Fox Type	Ear Size / Purpose (Answer in Ruby Red)
Forest Fox	- Small and short ears (to retain body warmth in cold climates).
Fennec Fox	- Extraordinarily large ears (to radiate heat and cool down).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Class Activity (2-1): Butterfly Life Cycle | Exercises and Evaluations

First: Class Activity (Classify & Know) (10 Marks)

Look at the diagram of the butterfly life cycle. Examine it and answer the following:

(A) Complete: (5 Marks)

1. The shape of the butterfly changes from the egg to the final stage through the process of
   Complete Metamorphosis (Growth & Transformation). (2 Marks)
2. Answer: "The butterfly undergoes a magical transformation during its growth"
   Mention one piece of evidence supporting this statement. (3 Marks)
   Answer: Because the butterfly passes through four completely different stages in shape, structure, and feeding habits: Egg, then Larva/Caterpillar, then resting Chrysalis/Pupa, and finally the winged adult Butterfly, where the adult butterfly does not resemble the worm-like caterpillar at all.

Class Activity Continued (Learning Journey)

Here are the stages of the butterfly life cycle:

1. Arrange the following stages in the correct order, writing the name of each stage under its picture: (4 Marks)

Adult winged butterfly flying	Brown pupa hanging from a twig	Striped worm-like larva eating a leaf	Small eggs on a leaf
Order: **4** Name: **Adult Insect**	Order: **3** Name: **Chrysalis (Pupa)**	Order: **2** Name: **Larva (Caterpillar)**	Order: **1** Name: **Eggs**

2. Write the name of the stage that matches each description below: (3 Marks)
   a. Has an oval, full, and smooth shape: **Egg** (1 Mark)
   b. Has a head, thorax, and abdomen, with legs and 4 wings: **Adult Butterfly** (1 Mark)
   c. The stage in which it eats the most amount of food: **Larva (Caterpillar)** (1 Mark)

3. Compare the Larva and the Chrysalis in terms of Feeding and Next Stage: (3 Marks)

Point of Comparison	Larva (Caterpillar)	Chrysalis (Pupa)
Feeding	Eats plant leaves voraciously to grow	Does not eat at all (resting stage)
Next Stage	Chrysalis (Pupa)	Adult Butterfly (Complete Insect)

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Class Activity (2-3): Body Structure of Adult Insects | Exercises & Evaluations

Class Activity: Science Application (10 Marks)

* Here is an observation record card for a spider. Look at the picture and complete the card: (4 Marks)

Spider Observation Record Card

Organism name: Spider

Date: August 2026 | **Class:** Grade 4 | **Name:** [Teacher Copy]

Number of legs: 8 legs (4 pairs of jointed legs)

Presence of antennae: Absent (None)

Presence of wings: Absent (None)

(A) Answer: Is a spider considered an insect? Prove your answer. (2 Marks)

Answer: No, a spider is not considered an insect; because a spider possesses 8 jointed legs (4 pairs) and its body is divided into only two parts, and it has no wings or antennae. On the other hand, insects have exactly 6 legs (3 pairs), wings, and antennae.

(B) Based on what you have studied about insects and the spider's activity, compare a Bee and a Spider: (4 Marks)

Point of Comparison	Honeybee	Spider
Presence of wings	Present (Has 4 wings)	Absent (None)
Presence of antennae	Present (Has a pair of antennae)	Absent (None)
Number of legs	6 jointed legs (3 pairs)	8 jointed legs (4 pairs)

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Homework Assignments | Growth and Metamorphosis of Insects

Homework (10 Marks)

1 Complete: In the butterfly life cycle, the stage that emerges from the egg is called **the Larva (Caterpillar).** (1 Mark)

2 Compare: The butterfly in the larva and chrysalis stages in terms of feeding and next stage: (3 Marks)

Point of Comparison	Larva (Caterpillar)	Chrysalis (Pupa)
Feeding	Eats plant leaves voraciously to grow	Does not eat at all (resting stage)
Next Stage	Chrysalis (Pupa)	Adult Butterfly (Complete Insect)

3 Mention the definition of Molting (Ecdysis)? (2 Marks)

A vital process in which the larva sheds its old, rigid outer skin (cuticle) that cannot grow with it, and replaces it with a new, larger, and more flexible skin to accommodate its rapidly growing body.

4 Where do butterflies lay their eggs? (2 Marks)

They usually lay eggs on the underside (back) of green plant leaves to protect them from environmental hazards and ensure immediate food is available for larvae upon hatching.

5 What happens if: The larva cannot find enough plant leaves for its food? (2 Marks)

It will not obtain the sufficient energy and nutrients required for its rapid growth and molting, which will halt its life cycle and cause it to die before transforming into a chrysalis and adult.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Weekly Assessment (Groups A & B) | Exercises and Evaluations

Group (A) (5 Marks)

(1) Choose the correct answer: Most insects lay their eggs usually on: (1 Mark)

a) Dead, dry tree trunks.
b) **The underside (back) of plant leaves.** ← Correct Answer
c) Extremely high mountain peaks.
d) Dry rocks in the open desert.

(2) Explain: The newly hatched larva eats huge amounts of food very quickly. (1 Mark)

Answer: To store energy and nutrients necessary for its extremely rapid growth, to perform successive molting processes, and to prepare for the transformation stage inside the chrysalis.

(3) Write the number indicating: (1 Mark)

- Number of legs of a bee: 6 legs (3 pairs).
- Number of body parts of a butterfly: 3 parts (head, thorax, and abdomen).

(4) What happens if: The larva is unable to perform the molting process and shed its skin during its continuous growth? (1 Mark)

Answer: Its body cannot expand and grow further because the outer skin is rigid and does not grow, which leads to the compression of its internal organs, halting of its life cycle, and death.

(5) Compare: The shape of the butterfly in the chrysalis (pupa) and adult stages in terms of ability to move and feeding: (1 Mark)

Point of Comparison	Chrysalis (Pupa)	Adult Butterfly
Ability to move	Completely stationary and cannot move	Very active, flies and moves constantly
Feeding	Does not feed at all	Feeds on flower nectar

Group (B) (5 Marks)

(1) Choose the correct answer: The small insect that has just hatched from the egg is called: (1 Mark)

a) Adult or complete insect.
b) **Larva.** ← Correct Answer
c) Chrysalis (Pupa).
d) Egg.

(2) Write the number indicating: (1 Mark)

- Number of wings of a bee: 4 wings (2 pairs).
- Number of antennae of a butterfly: 2 antennae (1 pair).

(3) Mention an example of: A safe place that insects resort to for protecting their eggs. (1 Mark)

Answer: Underneath plant leaves (or inside moist rock crevices and under dry tree bark).

(4) What happens if: An insect egg hatches in a dry environment completely free of food and suitable host plants? (1 Mark)

Answer: The newly hatched larva will die immediately because it cannot find the food and moisture essential to sustain life and growth in its first hours.

(5) Are the eggs of all insects similar (Yes / No) ? Explain your answer. (1 Mark)

Answer: No; insect eggs differ in shape (oval, round, or barrel-shaped), color, size, and methods of protection depending on the insect species and environment to ensure survival.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Weekly Assessment: Week 4 (Group C) | Exercises and Evaluations

Group (C) (10 Marks)

(1) Choose the correct answer: The process of molting in insects mainly means that the larva: (2 Marks)

a) Lays eggs in large numbers on leaf surfaces.

b) Searches for huge amounts of food to store.

c) Sheds its old skin and replaces it with a larger body. ← Correct Answer

d) Enters a long dormant period under the soil.

(2) Write the number indicating: (2 Marks)

- Number of stages in the honeybee's life cycle:

  4 stages (Complete Metamorphosis: egg, larva, pupa, and adult).

- Number of eyes of a butterfly:

  2 (Two large compound eyes for panoramic vision).

(3) Mention an example of: A transitional stage in an insect's life characterized by very rapid growth and heavy food consumption. (2 Marks)

Answer: The Larva (Caterpillar / اليسروع).

(4) What happens if: The body of the larva grows and increases rapidly in size without its outer skin stretching? (2 Marks)

Answer: The rigid skin becomes too tight and restricts its growth, so the larva instinctively triggers the molting process to shed the old tight skin and replace it with a new, wider skin to continue its development safely.

(5) Mention three characteristics of the butterfly's body. (2 Marks)

Answer: 1- The body is divided into three distinct segments: head, thorax, and abdomen.

2- It has six jointed legs (three pairs attached to the thorax region).

3- It has four wings (two pairs of large, colorful wings covered with scales).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

First: Class Activity - Seed Investigation

* You have a variety of dry seeds: (Chickpea, Bean, Lentil, Kidney Bean) in order from top to bottom. Examine the pictures and then complete the following table to classify the seeds:

Seed	Color	Size (Large/Medium/Small)	Texture (Rough/Smooth)
Chickpea	Yellowish Brown	Medium	Rough
Broad Bean	Dark Brown	Large	Smooth
Lentil	Orange	Small	Smooth
Kidney Bean	White	Medium	Smooth

Learning Journey - Kinds and Stages of Seeds

* Track the growth stages of a seed and design your own "Germination Passport" using the following information:

1. Page 1 (Seed Details): My name: Corn seed, my home: Warm moist soil, my size: Medium.
2. Page 2 (Germination): The seed splits and a small radicle (root) emerges downwards, and the germination condition is: Availability of water and suitable temperature.
3. Page 3 (Young Plant): Appearance of a small stem upwards and green leaves. "My leaves have appeared, and I need sunlight to make my own food."
4. Page 4 (Flowers): The plant grows large and flowers bloom. "I have grown up and produced colorful flowers to attract bees."
5. Page 5 (Fruit): The flower transforms into a delicious fruit containing new seeds. "The flower turned into a delicious fruit carrying seeds to begin the journey again."

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Learning Journey: Seed Journey and Germination Passport Activation

Seed Germination Passport Activation (10 Marks)

* Congratulations! You have received your (Germination Passport).
Answer the following questions to successfully activate your seed growth visa:

Q1: Write three characteristics of different seeds: (3 Marks)

1. Seeds differ in size (large seeds like beans and chickpeas, small seeds like lentils).
2. Seeds differ in texture (smooth seeds like kidney beans, rough seeds like chickpeas).
3. Seeds differ in shape and color (white color for kidney beans, orange for lentils, dark brown for beans).

Q2: Arrange the stages of seed growth by placing consecutive numbers from (1 to 4) inside the parentheses: (4 Marks)

* (4) The first green leaves open, and the seedling continues to grow.
* (2) The small root (radicle) grows downwards into the soil to absorb water and anchor the plant.
* (1) The seed absorbs water and swells, causing its outer coat to split.
* (3) The small stem grows upwards out of the soil, and the seedling begins to appear.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Secret of Shape and Function Mapping (Match Questions)

* Imagine that each part of the plant has separated from the rest. Match each part with its image and function correctly:

Plant Part	Function and Correct Mapping
Root	⇐ I anchor the plant in the soil and absorb water and minerals.
Stem	⇐ I carry the leaves and flowers, and transport water to them.
Leaves	⇐ I have a flat shape and capture sunlight to make food.
Flowers	⇐ I help the plant to reproduce and turn into fruits and seeds.

Second: Homework Assignments

(1) **Complete:** The part that extends under the soil surface and absorbs water is the **Root (or Roots).** (2 Marks)

(2) **Explain why:** Some plant leaves have a wide and flat shape. (2 Marks)
To capture and absorb the maximum possible amount of sunlight needed to perform photosynthesis and make food.

(3) **Write what** the following statement indicates: A part of the plant that acts as a "passage" to transport water to the rest of the parts. **The Stem.** (2 Marks)

(4) **What happens if:** A plant has absolutely no **roots**, and the soil is exposed to a strong storm and winds? (2 Marks)
The plant cannot anchor itself in the soil or absorb water, and the strong storm and winds will uproot the plant, leading to its immediate death.

(5) **Compare: Plant Root** and **Plant Stem** in terms of (the basic function of each). (2 Marks)

- **Plant Root:** **Anchors the plant firmly in the soil and absorbs water and dissolved salts from it.**
- **Plant Stem:** **Supports plant parts, carries leaves and flowers, and acts as a passage to transport water and nutrients upwards.**

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Weekly Assessment for Week 5 (Groups A & B)

Group (A) [5 Marks]

1. Choose the correct answer: The main function of the stem in a plant is to: (1 Mark)
   (A) Absorb water and dissolved minerals from the soil.
   (B) Support the plant and act as a passage to transport water to leaves. ⇐ Correct Answer
   (C) Capture the largest possible amount of sunlight.
   (D) Anchor the plant firmly in the soil.
2. Explain why: Seeds differ significantly in size, shape, and color. (1 Mark)
   Answer: Due to differences in plant species, environments, and adaptations that help each seed disperse and germinate successfully.
3. Write what the following statement indicates: A main part of the plant responsible directly for capturing sunlight. (1 Mark)
   Answer: Leaves (or Plant Leaves).
4. What happens if: The stem of the plant is completely damaged? (1 Mark)
   Answer: Water and mineral transport from roots to leaves stops, and food transport from leaves to the rest of the plant stops, leading to plant wilting and death.
5. Compare: Seed leaves (cotyledons) and True leaves of a broad bean plant. (1 Mark)
   - Seed Leaves (Cotyledons): They appear first during germination and are thick because they store food to nourish the growing embryo.
   - True Leaves: They appear later, being thin, green, and flat to perform photosynthesis and make food using sunlight.

Group (B) [5 Marks]

1. Choose the correct answer: The part responsible for capturing the largest possible amount of sunlight in a plant is: (1 Mark)
   (A) Deep roots.
   (B) Strong stem.
   (C) Wide and flat leaves. ⇐ Correct Answer
   (D) Flowers.
2. Explain why: The stem is described as a "passage" or a vital transport network inside the plant body. (1 Mark)
   Answer: Because it contains specialized tubes (like xylem) that transport water and minerals from roots upwards to leaves, and transport food downwards.
3. State the number of seed leaves (cotyledons) of a broad bean plant. (1 Mark)
   Answer: Two seed leaves (dicotyledon).
4. What happens if: New seeds fall on suitable soil? (1 Mark)
   Answer: If moisture and warm soil are available, they will germinate; the root grows down and the shoot grows up to form a new plant.
5. Compare: Broad bean plant and Sunflower plant in terms of (the best months of the year for their cultivation). (1 Mark)
   - Broad Bean Plant: Winter crop (best planted in winter months: October and November).
   - Sunflower Plant: Summer/Spring crop (best planted from March and April until July).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Weekly Assessment for Week 5 (Group C)

Group (C) [10 Marks]

1. Complete the following sentence: (2 Marks)

A plant basically consists of three main parts: **Roots**, **Stem**, and **Leaves**.

2. Explain why: Some plant leaves have a wide and flat shape. (2 Marks)

Answer: To increase the surface area exposed to sunlight, thereby capturing the maximum possible amount of light to make food efficiently.

3. Mention an example of a plant that has exactly two seed leaves (cotyledons). (2 Marks)

Answer: Broad bean plant (or Chickpea / Pea).

4. What happens if: Plant roots grow above the soil surface instead of being inside the soil? (2 Marks)

Answer: The plant cannot anchor itself firmly and will fall easily, and it cannot absorb enough water and nutrients from deep in the ground, leading to plant death.

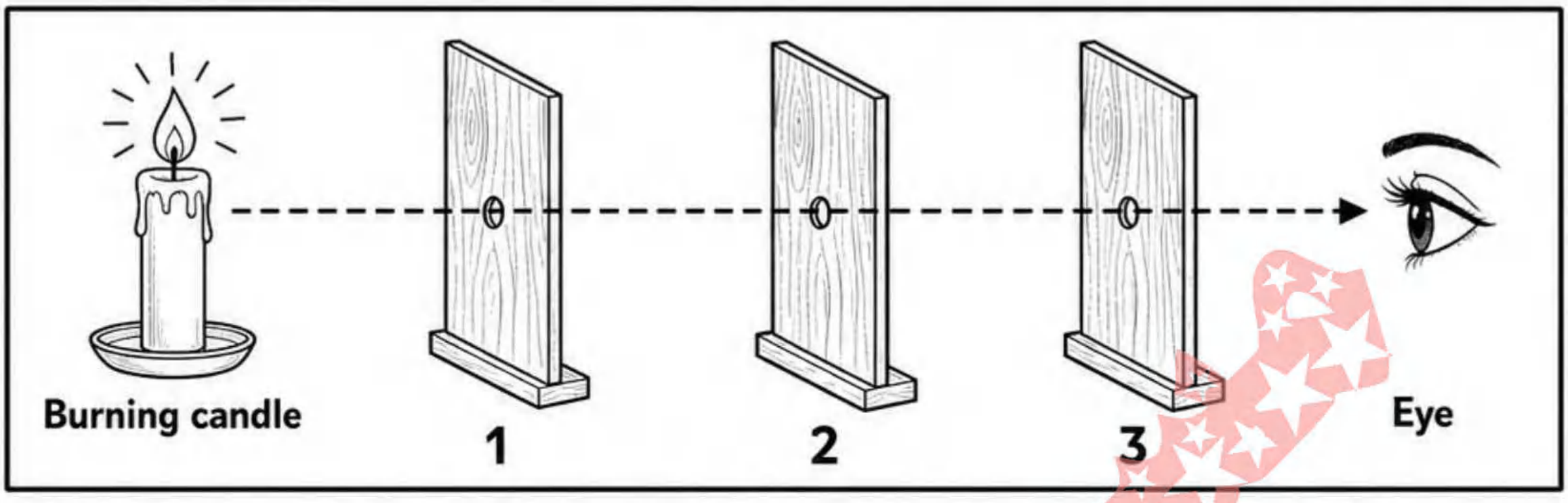
5. Arrange the following stages of plant growth by placing consecutive numbers from (1 to 4) inside the parentheses: (2 Marks)

- (3) Flowering (Flowers open).
- (2) Bud formation.
- (1) Growth of stem and leaves.
- (4) Production of fruits.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

First: Class Activity: Discover the Mystery of Light

* Collaborate with your classmate in your group, observe the following diagram of three plates with holes in front of a burning candle, then answer the following questions:



1- What do you observe when looking through the hole of the first plate when the three holes are aligned in a straight line?

Answer: I observe the light of the burning candle clearly

2- Does the person see the candle's light if any of the three plates are moved?

Answer: No, the person cannot see the candle's light because light travels in straight lines and does not bend behind the moved plate

3- Complete: Light reflected from a mirror travels in straight lines.

Learning Journey: Burning Paper with Sunlight

* Your classmate performed an experiment to focus sunlight on a piece of paper.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Learning Journey: Burning Paper with Sunlight (Cont.)

1- What happens when: focusing sunlight into a single point using a magnifying glass and concentrating it on a paper for a while?
Answer: The temperature of the paper rises extremely and it gets burned (catches fire) due to concentrating light and thermal energy in a single point.

2- Mention safety precautions to your classmate while performing this experiment?
Answer: Avoid looking directly at the sun's disk through the magnifying glass to protect the retina from damage or blindness, and do not touch the concentrated hot point with your hands.

Second: Homework Assignments

(1) Complete: When sunlight falls on a mirror and bounces, the reflected light travels in straight lines.

(2) Give reason: Avoid looking directly at the sun using a magnifying glass.
Answer: Because the magnifying glass concentrates and focuses the hot, harmful solar rays onto a single point falling on the eye's retina, causing immediate damage or blindness.

(3) Give an example of: A material or a medium that can be scattered or sprayed in the air to track and see the reflected light path dimly.
Answer: Starch powder (or dust / water vapor / smoke).

(4) What happens if: The focused point of sunlight under the magnifying glass becomes smaller?
Answer: The brightness intensity increases and the temperature rises extremely at this concentrated point.

(5) Compare between: The path of sunlight when it falls on a mirror and when it falls on a rough surface:

Point of Comparison	Light Path when falling on a Mirror	Light Path when falling on a Rough Surface
Reflection Type	Regular Reflection	Irregular (Diffused) Reflection
Direction of Bouncing	Reflects in one direction (parallel)	Scatters in many different directions

Third: Weekly Assessment - Group (A)

1- Choose the correct answer:
All of the following are correct about how sunlight travels, EXCEPT:
(A) Sunlight always has the property of traveling in a straight line.
(B) Sunlight continues to travel in straight lines after bouncing off a mirror.
(C) When sunlight bounces off a mirror, it starts moving in a curved line. ✓ (Correct Answer)
(D) The path of light can be observed by scattering a little starch.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Learning Journey: Burning Paper with Sunlight (Cont.)

1- What happens when: focusing sunlight into a single point using a magnifying glass and concentrating it on a paper for a while?

Answer: The temperature of the paper rises extremely and it gets burned (catches fire) due to concentrating light and thermal energy in a single point.

2- Mention safety precautions to your classmate while performing this experiment?

Answer: Avoid looking directly at the sun's disk through the magnifying glass to protect the retina from damage or blindness, and do not touch the concentrated hot point with your hands.

Second: Homework Assignments

(1) Complete: When sunlight falls on a mirror and bounces, the reflected light travels in straight lines.

(2) Give reason: Avoid looking directly at the sun using a magnifying glass.

Answer: Because the magnifying glass concentrates and focuses the hot, harmful solar rays onto a single point falling on the eye's retina, causing immediate damage or blindness.

(3) Give an example of: A material or a medium that can be scattered or sprayed in the air to track and see the reflected light path dimly.

Answer: Starch powder (or dust / water vapor / smoke).

(4) What happens if: The focused point of sunlight under the magnifying glass becomes smaller?

Answer: The brightness intensity increases and the temperature rises extremely at this concentrated point.

(5) Compare between: The path of sunlight when it falls on a mirror and when it falls on a rough surface:

Point of Comparison	Light Path when falling on a Mirror	Light Path when falling on a Rough Surface
Reflection Type	Regular Reflection	Irregular (Diffused) Reflection
Direction of Bouncing	Reflects in one direction (parallel)	Scatters in many different directions

Third: Weekly Assessment - Group (A)

1- Choose the correct answer:

All of the following are correct about how sunlight travels, EXCEPT:

(A) Sunlight always has the property of traveling in a straight line.

(B) Sunlight continues to travel in straight lines after bouncing off a mirror.

(C) When sunlight bounces off a mirror, it starts moving in a curved line. (Correct Answer)

(D) The path of light can be observed by scattering a little starch.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Weekly Assessment: Week 6 | Group (C)

Weekly Assessment: Group (C)

(1) Choose the correct answer:

- The smaller the focused point of light becomes, it becomes:

(A) Less bright and less hot

(B) More bright and less hot

(C) Less bright and more hot

(D) (✓) More bright and more hot. (Correct Answer)

(2) Complete the sentence: Sunlight focuses in a single point of high temperature when using a magnifying glass for a specific period of time.

(3) What do we call the bouncing of light when it falls on a surface?

Answer: Reflection of light.

(4) Mention two things that should NOT be done when performing the light focusing experiment?

Answer:

1. Never look directly at the sun using the magnifying glass to protect your eyes.
2. Do not direct the focused hot point of light towards others' eyes or skin to avoid burns.

(5) Give an example of: A source of light that exists in nature and sends light continuously.

Answer: The Sun (or Stars).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Week 6 | Third: Weekly Assessment: Group (A) & Group (B)

Weekly Assessment: Group (A) [Continued]

2- What happens when: focusing sunlight using a magnifying glass onto a paper surface.
Answer: The temperature of the paper rises extremely and it gets burned (catches fire).

3- What is the error in the following behavior? A student looks directly at the sun using a magnifying glass to test the light intensity.
Answer: This behavior is extremely wrong and dangerous; because the magnifying glass concentrates and focuses the hot, intense solar rays directly onto the retina, causing immediate permanent eye damage or blindness.

4- Give an example of: A rough surface that reflects falling light in a scattered way in different directions.
Answer: A wall (or wood / a leaf / a piece of cloth).

5- Define: Light Source:
Answer: It is any object that emits or radiates its own light.

Weekly Assessment: Group (B)

(1) Choose the correct answer:
- Bouncing of light in straight lines when it hits a smooth, polished surface represents the phenomenon of:

(A) (✓) Reflection (Correct Answer)
(B) Refraction
(C) Absorption
(D) Emission

(2) Complete the sentence: Light travels in straight lines.

(3) Why do we scatter a little starch in the area where light passes?
Answer: To scatter the light rays very dimly, which helps us see and track the path of the reflected light clearly.

(4) What happens when: We use a magnifying glass to focus sunlight into a small point on a black paper?
Answer: The black paper absorbs all focused light and heat extremely fast, its temperature rises, and it burns and catches fire in a very short time (much faster than white paper).

(5) Mention two sources of light:
Answer: 1. The Sun and 2. Electric Lamp (or Candle / Fire).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

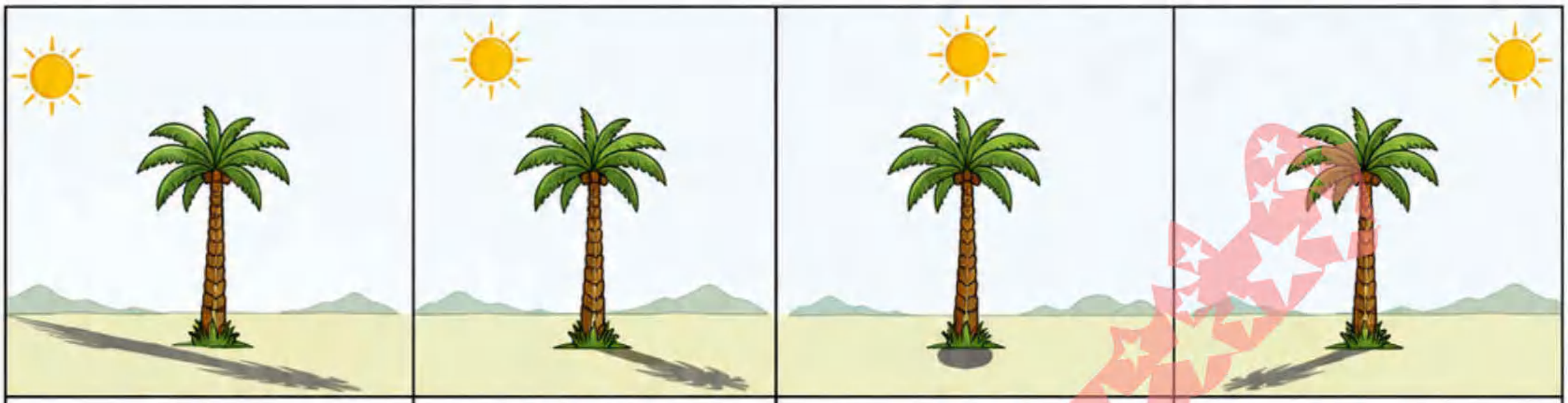
First: Class Activity | Observation and Exploration Activities (Shadows and the Sun)

First: Class Activity (Observation & Exploration)

Lesson Topic: 4-3 Shadows and the Sun (1) | 4-4 Shadows and the Sun (2)

Activity (1): Sun Movement and Shadow Position Changes

In cooperation with your group partner, observe the movement of shadows and the effect of sunlight, then answer:



8:00 AM	11:30 AM	1:00 PM	4:30 PM
Shadow is very long and points to the West	Shadow shortens and points North-West	Shadow is extremely short right under the tree	Shadow is very long and points to the East

1. The direction of the shadow is always opposite to the direction of the sun.
2. When an object blocks the sunlight, a dark area is formed behind it called the shadow.
3. As the sun moves, the shadow is formed on the opposite side of the sun; therefore, the position of the shadow also changes.

Activity (2): The Effect of Shadow on Temperature

Complete the following sentences with the correct conclusion:

1. The temperature of sunny areas becomes higher (warmer) compared to shaded areas.
2. Shaded areas are cooler, and they are usually more humid (wetter) compared to sunny areas.

Trace Shadows to Know Your Time

Here are several situations your classmates encountered. What do you expect to happen as a result?
Match Column (A) with the appropriate result in Column (B):

(A) Situation	(B) Expected Result
1- The sun is at its highest point (Noon).	(1) A very short shadow is formed under the body.
2- Sunlight falling on an object.	(2) A shadow is formed in the opposite direction.
3- The sun during early morning.	(3) A very long shadow is formed for the body.
4- Blocking direct sunlight from a place.	(4) The temperature of the ground drops here.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Second: Homework Assignments & Third: Weekly Assessment (Group A)

Second: Homework Assignments

1- When measuring the temperature of the ground using a thermometer, what procedure must be followed?
Answer: The thermometer must be placed in the shade (away from direct sunlight) to obtain an accurate measurement of the surrounding air temperature without being affected by the direct solar radiation heating the body of the device itself.

2- Give reasons: The temperature of sunny areas rises over time.
Answer: Because the ground surfaces in sunny areas continuously absorb the light and heat energy coming from the sun, converting and storing it as thermal energy that heats the surface and the air in contact with it.

3- Determine the validity of the following statement: "The ground in shaded areas is often more humid compared to sunny areas."
Answer: The statement is correct; because the absence of direct sunlight in shaded places reduces the rates of water evaporation from the soil, which keeps it damp and cool compared to sunny places that suffer from high heat and rapid evaporation.

4- Explain the cause of shadow formation as you learned from the lesson?
Answer: Shadows are formed when light (which travels in straight lines) hits an opaque object, which blocks the passage of light rays through it, resulting in a dark area of the same shape forming behind it.

5- When do we get the shortest shadow length during the day?
Answer: At noon (when the sun is at its highest point in the sky, nearly vertical or perpendicular to objects).

Third: Weekly Assessment - Group (A)

Question One: Answer the following questions:

1- Choose the correct answer: A very long shadow of objects on the ground is formed at:
(Noon / Early Night / Early Morning / Midnight)

2- When is a shadow formed?
Answer: When an opaque object blocks the path of light, creating a dark, unlit area behind it.

3- What happens if: The apparent position of the sun in the sky changes from East to West regarding the extension of the shadow?
Answer: The direction and length of the shadow change gradually; it starts very long pointing West in the morning, shortens to its shortest length directly under the body at noon, and then extends very long pointing East in the afternoon and evening.

4- Mention how to use an infrared thermometer?
Answer: The infrared thermometer is pointed from a distance towards the surface to be measured (without touching it), then the power button is pressed to instantly display the accurate temperature reading on the digital screen.

5- State the scientific reason: Shadows are always in the opposite direction of the sun?
Answer: Because light travels in straight lines, and when it hits an opaque body, it gets blocked, preventing the sunlight from reaching directly behind the body, so the shadow forms on the side opposite to the light source.

Third: Weekly Assessment | Groups (B) & (C) - Page 39

Third: Weekly Assessment - Group (B)

1- Choose the correct answer: When we gradually move an opaque object away from a flashlight towards a wall, its shadow length:
(Increases / Decreases / Doubles / Remains constant)

2- What happens if: Sunlight falls at noon on a pole in the schoolyard?
Answer: A very short shadow is formed directly under the base of the pole (the shortest shadow length possible during the day).

3- Define the solar clock (sun dial)?
Answer: An ancient tool (such as the sundial) used to determine time during the day depending on the change in length and position of the shadows of objects resulting from the apparent movement of the sun.

4- What is the name of the tool used to measure the temperature of every place?
Answer: The temperature measuring tool (Thermometer or Infrared Thermometer).

5- Give scientific reasons: The ground in sunny areas becomes warmer than the ground in shaded areas?
Answer: Because sunny areas receive direct sunlight and continuously absorb its light and heat energy, while shaded areas are blocked from direct sunlight and do not heat up to the same degree.

Third: Weekly Assessment - Group (C)

1- Choose the correct answer: When the sun is at its highest point in the sky (Noon), the shadow of objects is:
(Very long pointing West / Very long pointing East /
Very short and directly under the body)

2- What happens if: Sunlight falls in the early morning on a pole in the schoolyard?
Answer: A very long shadow is formed for the pole extending in the West direction (the opposite direction of sunrise).

3- Give reasons: Using an infrared thermometer?
Answer: To measure the surface temperature of the ground or different bodies from a distance, with high speed and accuracy, without requiring direct contact with the surface.

4- What is the name of the tool used to tell time through the change of shadow position?
Answer: The solar clock (Sundial).

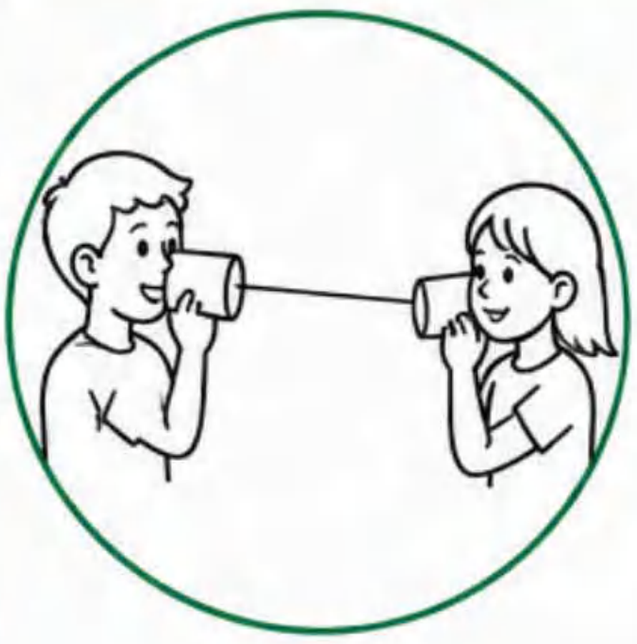
5- Answer: If the clouds suddenly disappear and the ground becomes sunny, what do you expect to happen regarding: (The shadow area on the ground)?
Answer: Clear and defined shadows will immediately appear behind all opaque objects (such as buildings and trees) exposed to direct sunlight, accompanied by an immediate rise in the ground temperature around them.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Class Activity: How is sound produced? | Sound and Vibration Experiments

First: Class Activity (Discover the Secret of Sound)

* **Collaborate with your classmates in groups to perform the following observations and record your conclusions:**



[Experimental Setup 1]:
String Telephone Experiment

An illustration of two students talking through a tightly stretched string telephone connected between two paper cups.

[Experimental Setup 2]:
Vibrating Balloon Experiment

An illustration of a balloon stretched tightly over a cup, with grains of rice and sand placed on top. A student speaks loudly near this stretched membrane.

Observe and Discuss:

1. When talking through the string telephone, what transfers the vibrations from the first cup to the second cup?

Model Answer: The stretched string (which vibrates and transmits the sound waves)

2. If we place grains of rice (or sand) on top of the balloon and speak loudly, why do the grains jump and move?

Model Answer: Because of the vibration of the balloon membrane caused by the sound energy from the loud voice

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Class Activity: How is sound produced? | Sound and Vibration Experiments

First: Class Activity

(Discover the Secret of Sound)

Collaborate with your classmates in groups to perform the following observations and record your conclusions:

[Experimental Setup 1]: String Telephone Experiment

An illustration of two students talking through a tightly stretched string telephone connected between two paper cups.

[Experimental Setup 2]: Vibrating Balloon Experiment

An illustration of a balloon stretched tightly over a cup, with grains of rice and sand placed on top. A student speaks loudly near this stretched membrane.

Observe and Discuss:

1. When talking through the string telephone, what transfers the vibrations from the first cup to the second cup?

   Model Answer:

   The stretched string (which vibrates and transmits the sound waves)

2. If we place grains of rice (or sand) on top of the balloon and speak loudly, why do the grains jump and move?

   Model Answer:

   Because of the vibration of the balloon membrane caused by the sound energy from the loud voice

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Class Activity: Defining Vibrations and Classifying Mediums

Conclude and Complete the Sentences

* **Conclude and complete the following sentences based on your discussion with your classmate:**

- **Sounds are produced when objects move up and down or back and forth. This movement is called Vibration.**
- **Sound travels better when the string is stretched, whereas sound stops completely if we hold the string tightly with our fingers to prevent Vibration (Vibrations).**

Complete the Chart with Your Group

* **Classify the following materials in the attached table based on their ability to handle sound vibrations and transmit them:**

(Iron - Sponge - Wood - Air)

Materials that transmit sound vibrations very well	Materials through which sound travels with lower efficiency
- Iron - Wood	- Air - Sponge

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Second: Homework Assignments

1. Complete the following sentences:

a) An object produces a loud sound when it **vibrates** with a **large (strong)** **vibration**.

b) Soft sounds are produced when the sound source moves a small distance, which indicates that the amount of **vibration** is **small (weak)** .

2. Answer:

What happens if: we touch our throat with our fingers during complete silence, and then talk in a loud voice? Explain what you feel in both cases scientifically.

Model Answer:

- During complete silence: We do not feel any **vibration** in the throat because the vocal cords are not **vibrating**.
- When talking loudly: We feel clear and strong **vibrations** in the throat under our fingers because **sound** scientifically originates from the **vibration** of the **vocal cords**.

3. Give reasons for the following:

a) A bell produces a sound when struck.

Model Answer:

Because of the **vibration** of the bell body resulting from the striking process.

b) Hearing the sound of someone knocking is much clearer when placing your ear on the door.

Model Answer:

Because **sound** travels through **solid objects** (like the wooden door) much faster and better than through **air** (gases).

4. What happens in the following cases?

a) When plucking a guitar string with great force.

Model Answer:

The **strings** **vibrate** with a large distance (large **amplitude**), leading to a loud and strong **sound**.

b) Holding the string in the middle of a string telephone.

Model Answer:

The **sound** stops transmitting completely, because holding the string prevents it from **vibrating**, and thus stops the sound **transmission**.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Second: Homework Assignments

1. Complete the following sentences:

a) An object produces a loud sound when it **vibrates** with a **large (strong)** **vibration**.

b) Soft sounds are produced when the sound source moves a small distance, which indicates that the amount of **vibration** is **small (weak)** .

2. Answer:

What happens if: we touch our throat with our fingers during complete silence, and then talk in a loud voice? Explain what you feel in both cases scientifically.

Model Answer:

- During complete silence: We do not feel any **vibration** in the throat because the vocal cords are not **vibrating**.
- When talking loudly: We feel clear and strong **vibrations** in the throat under our fingers because **sound** scientifically originates from the **vibration** of the **vocal cords**.

3. Give reasons for the following:

a) A bell produces a sound when struck.

Model Answer:

Because of the **vibration** of the bell body resulting from the striking process.

b) Hearing the sound of someone knocking is much clearer when placing your ear on the door.

Model Answer:

Because **sound** travels through **solid objects** (like the wooden door) much faster and better than through **air** (gases).

4. What happens in the following cases?

a) When plucking a guitar string with great force.

Model Answer:

The **strings** **vibrate** with a large distance (large **amplitude**), leading to a loud and strong **sound**.

b) Holding the string in the middle of a string telephone.

Model Answer:

The **sound** stops transmitting completely, because holding the string prevents it from **vibrating**, and thus stops the sound **transmission**.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Second: Homework Assignments

1. Complete the following sentences:

a) An object produces a loud sound when it **vibrates** with a **large (strong)** **vibration**.

b) Soft sounds are produced when the sound source moves a small distance, which indicates that the amount of **vibration** is **small (weak)** .

2. Answer:

What happens if: we touch our throat with our fingers during complete silence, and then talk in a loud voice? Explain what you feel in both cases scientifically.

Model Answer:

- During complete silence: We do not feel any **vibration** in the throat because the vocal cords are not **vibrating**.
- When talking loudly: We feel clear and strong **vibrations** in the throat under our fingers because **sound** scientifically originates from the **vibration** of the **vocal cords**.

3. Give reasons for the following:

a) A bell produces a sound when struck.

Model Answer:

Because of the **vibration** of the bell body resulting from the striking process.

b) Hearing the sound of someone knocking is much clearer when placing your ear on the door.

Model Answer:

Because **sound** travels through **solid objects** (like the wooden door) much faster and better than through **air** (gases).

4. What happens in the following cases?

a) When plucking a guitar string with great force.

Model Answer:

The **strings** **vibrate** with a large distance (large **amplitude**), leading to a loud and strong **sound**.

b) Holding the string in the middle of a string telephone.

Model Answer:

The **sound** stops transmitting completely, because holding the string prevents it from **vibrating**, and thus stops the sound **transmission**.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Groups A & B)

Group (A)

1. Choose the correct answer:

When the membrane of a drum moves up and down very quickly when struck, this movement is called .....

(Rotation / Reflection / **Vibration**)

2. What happens when we pluck a rubber band gently (with respect to the vibration distance)?

Model Answer: The band moves a small distance (small amplitude), producing a soft, quiet sound.

3. Give reasons: Why is it necessary to stay away from loud sounds?

Model Answer: To protect our hearing and ears from damage and to prevent exhaustion of the nervous system.

4. Complete: Sound travels easily when the string is ..... **stretched** ..... .

5. Read the situation described below and determine the intensity of the sound reaching your ears:

[Situation]: Two children are using the string telephone. The string between the two cups is tightly stretched on a straight line with zero slackness.

- The sound is:

clear and strong (loud).

Group (B)

1. Choose the correct answer:

Which of the following procedures leads to directly damping (muting) the sound of a vibrating string in a musical instrument immediately?

(Increasing the tension / **Holding the string with a finger to prevent its movement** / Plucking with greater force)

2. Complete: Vibrations travel with difficulty in a string telephone when the string is ..... **slack (loose / un-stretched)** .

3. Correct the following statement: Sound vibrations travel through air only.

Correction: Sound travels through all physical mediums (solids, liquids, and gases).

4. What happens as the force with which we strike a musical membrane (like a drum) increases?

Model Answer: The vibration distance (amplitude) increases, producing a louder and stronger sound.

5. Read the situation described below and determine the intensity of the sound reaching your ears:

[Situation]: Two children are using the string telephone. The string between the two cups is loose, curved, and slack.

- The sound is:

very weak (or completely inaudible).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Second: Homework Assignments | Applications of Sound

Second: Homework Assignments

1 Complete the following sentences:

a) An object produces a loud sound when it vibrates with a large (strong) vibration.

b) Soft sounds are produced when the sound source moves a small distance, which indicates that the amount of vibration is small (weak).

2 Answer:

What happens if: we touch our throat with our fingers during complete silence, and then talk in a loud voice? Explain what you feel in both cases scientifically.

Model Answer:

- During complete silence: We do not feel any vibration in the throat because the vocal cords are not vibrating.
- When talking loudly: We feel clear and strong vibrations in the throat under our fingers because sound scientifically originates from the vibration of the vocal cords.

3 Give reasons for the following:

a) A bell produces a sound when struck.

Model Answer: Because of the vibration of the bell body resulting from the striking process.

b) Hearing the sound of someone knocking is much clearer when placing your ear on the door.

Model Answer: Because sound travels through solid objects (like the wooden door) much faster and better than through air (gases).

4 What happens in the following cases?

a) When plucking a guitar string with great force.

Model Answer: The strings vibrate with a large amplitude, leading to a loud and strong sound.

b) Holding the string in the middle of a string telephone.

Model Answer: The sound stops transmitting completely, because holding the string prevents it from vibrating, and thus stops the sound transmission.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Groups A & B)

Third: Weekly Assessment (Groups A & B)

Group (A)

1 **Choose the correct answer:**

When the membrane of a drum moves up and down very quickly when struck, this movement is called .....

(Rotation / Reflection / **Vibration**)

2 **What happens when we pluck a rubber band gently (with respect to the vibration distance)?**

Model Answer: The band moves a small distance (small amplitude), producing a soft, quiet sound.

3 **Give reasons:** Why is it necessary to stay away from loud sounds?

Model Answer: To protect our hearing and ears from damage and to prevent exhaustion of the nervous system.

4 **Complete:** Sound travels easily when the string is **stretched**.

5 **Read the situation described below and determine the intensity of the sound reaching your ears:**

[Situation]: Two children are using the string telephone.
The string between the two cups is tightly stretched on a straight line with zero slackness.

- The sound is: clear and strong (loud).

Group (B)

1 **Choose the correct answer:**

Which of the following procedures leads to directly damping (muting) the sound of a vibrating string in a musical instrument immediately?

(Increasing the tension /
Holding the string with a finger to prevent its movement /
Plucking with greater force)

2 **Complete:** Vibrations travel with difficulty in a string telephone when the string is **slack (loose / un-stretched).**

3 **Correct the following statement:**

Sound vibrations travel through air only.
Correction: Sound travels through all physical mediums (solids, liquids, and gases).

4 **What happens as the force with which we strike a musical membrane (like a drum) increases?**

Model Answer: The vibration distance (amplitude) increases, producing a louder and stronger sound.

5 **Read the situation described below and determine the intensity of the sound reaching your ears:**

[Situation]: Two children are using the string telephone.
The string between the two cups is loose, curved, and slack.

- The sound is: very weak (or completely inaudible).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Groups A & B)

Third: Weekly Assessment (Groups A & B)

Group (A)

1 **Choose the correct answer:**

When the membrane of a drum moves up and down very quickly when struck, this movement is called .....

(Rotation / Reflection / **Vibration**)

2 **What happens when we pluck a rubber band gently (with respect to the vibration distance)?**

Model Answer: The band moves a small distance (small amplitude), producing a soft, quiet sound.

3 **Give reasons:** Why is it necessary to stay away from loud sounds?

Model Answer: To protect our hearing and ears from damage and to prevent exhaustion of the nervous system.

4 **Complete:** Sound travels easily when the string is **stretched**.

5 **Read the situation described below and determine the intensity of the sound reaching your ears:**

[Situation]: Two children are using the string telephone.
The string between the two cups is tightly stretched on a straight line with zero slackness.

- The sound is: clear and strong (loud).

Group (B)

1 **Choose the correct answer:**

Which of the following procedures leads to directly damping (muting) the sound of a vibrating string in a musical instrument immediately?

(Increasing the tension /
Holding the string with a finger to prevent its movement /
Plucking with greater force)

2 **Complete:** Vibrations travel with difficulty in a string telephone when the string is **slack (loose / un-stretched).**

3 **Correct the following statement:**

Sound vibrations travel through air only.
Correction: Sound travels through all physical mediums (solids, liquids, and gases).

4 **What happens as the force with which we strike a musical membrane (like a drum) increases?**

Model Answer: The vibration distance (amplitude) increases, producing a louder and stronger sound.

5 **Read the situation described below and determine the intensity of the sound reaching your ears:**

[Situation]: Two children are using the string telephone.
The string between the two cups is loose, curved, and slack.

- The sound is: very weak (or completely inaudible).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Group C)

Third: Weekly Assessment (Group C)

Group (C)

1 **Choose the correct answer:**

The buzzing sound of bees during flight is produced by the vibration of their wings.
If a bee lands on a flower and stops moving its wings, ...
(The sound becomes louder / The sound stops immediately / The sound continues with the same intensity)

2 **What happens when we pluck a rubber band with great force (with respect to the vibration distance)?**

Model Answer:

The vibration distance (amplitude) increases, producing a loud and strong sound.

3 **Give reasons: What are the dangers of using headphones for a long period?**

Model Answer:

Because they focus high sound waves directly inside the ear canal,
causing damage to the auditory nerve cells and leading to gradual hearing loss.

4 **Define Vibration:**

Model Answer:

It is the back-and-forth, up-and-down, or left-and-right repetitive and rapid movement of an object around its equilibrium (rest) position.

5 **Read the situation described below and determine the intensity of the sound reaching your ears:**

[Situation]: Two children are using the string telephone, but another person is pinching/holding the string tightly in the middle to block any vibrations.

- The sound is: completely absent (sound does not transmit).

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

6 - 1 Cars Powered by Wind Power | 6 - 2 Sail Size

First: Class Activity (Discover the Secret of Sail)

* **Cooperate with your group partner, observe, and record your conclusion based on the practical experiment:**

[Practical Real-Life Case]: The Magic Sail Experiment

Two identical toy cars are placed on a wooden track in front of an electric fan operating at the exact same speed;

- **Car (A):** Has a large-sized triangular sail mounted on it.
- **Car (B):** Has a small-sized triangular sail mounted on it.

Observe and Discuss:

1. When the electric fan is turned on, which of the two cars will move backward a longer distance before stopping?

Model Answer: ..... **Car (A)** .....

Conclusion

* **Complete the following statement based on your group discussion:**

- **Car (A)** moves for a longer distance because the large sail has a **(large)** surface area, and therefore is exposed to a **(greater)** amount of air, making it affected by a **(greater)** force of wind.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

◆◆ Second: Homework | Applications of Sail Movement ◆◆

Second: Homework (Assignment)

1. Complete the following statements:

a) Force is considered an influence that causes the movement of objects or changes the direction of their motion.

b) As the force of the wind increases, it pushes objects for a longer distance compared to weak winds.

2. What happens as the surface area of the body that catches the wind increases?

Model Answer: The body's exposure to a larger amount of air increases, which leads to an increase in the wind's pushing force acting on it, causing it to move for a longer distance before stopping.

3. Give reasons: Changing the surface area of the sail causes a change in the movement of the sailboat.

Model Answer: Because changing the surface area of the sail changes the amount of air (wind) captured by the sail, which directly and proportionally affects the pushing force and the distance traveled.

4. Compare between a boat with a small sail and another with a large sail in terms of: the amount of air caught by each sail, and the distance traveled by the boat:

Boat with a Large Sail	Boat with a Small Sail
- Amount of air caught by the sail: Larger amount	- Amount of air caught by the sail: Smaller amount
- Distance traveled by the boat: Longer distance	- Distance traveled by the boat: Shorter distance

5. Explain one of the factors that affect the sailboat in covering a larger area (distance).

Model Answer: The surface area of the sail (the larger the sail area, the longer the distance covered) or the strength of the wind.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Group A)

Group (A)

1. Choose the correct answer:

When strong winds act on a wind-powered car, the force acting on it .....

(increases / decreases)

2. Complete the following statement:

When the size of the boat's sail is small, it is exposed to a (smaller) amount of air, and therefore covers a (shorter) distance.

3. Write True (✓) or False (×) with correction:

Force is the influence that causes the movement of a stationary object only and does not change its direction of motion.

Answer: (×) | Correction: Force causes a stationary object to move, stops a moving object, or changes its direction of motion.

4. Give reasons: A suitable sail size matched to the size of the boat must be used.

Model Answer:

To provide a balanced and appropriate pushing force for the boat's size; because a sail that is too small will not generate enough thrust, while an excessively large sail may cause the boat to capsize due to extreme force.

5. What happens if: We increase the speed of the electric fan directed toward a sail-powered car from low speed to high speed? Why?

Model Answer:

The speed of the sail car increases, and it travels a longer distance; Why? Because increasing the fan speed increases the wind's pushing force acting on the sail.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Groups B & C) | Application of Balanced Forces

Group (B)

1. Choose the correct answer:
The influence that causes objects to move or stop is known as:
(Distance / Volume / **Force**)

2. Complete the following statement:
The more the surface area of the sail exposed to the wind increases, the **more the amount of caught air increases, which increases the pushing force and the distance traveled.**

3. Write True (✓) or False (×):
The boat with the larger sail covers a shorter distance when the same wind blows compared to the boat with the smaller sail.
Answer: (×)
Correction: Covers a longer distance.

4. When making a car that operates by wind power, what happens when: The fan is adjusted to low speed?
Model Answer:
The car moves very slowly and covers a short distance because the wind pushing force is weak.

5. Give reasons: Fishing boats in the Nile River have large sails installed on them.
Model Answer:
To catch the maximum possible amount of the light winds available in the river, providing the boat with sufficient pushing force to move and cover long distances.

Group (C)

1. Choose the correct answer:
If the car with the larger sail moved a distance of 2 meters and 35 cm, it is expected that the car with the smaller sail will move a distance of .....
(3 meters and 55 cm / 2 meters and 35 cm / 3 meters 10 cm / **meter and 35 cm**)

2. Complete the following statement:
As the force of the wind acting on the sailboat increases, the **speed of the sailboat increases and it covers a longer distance.**

3. Write True (✓) or False (×):
We can clearly see the force of the wind with the naked eye as it touches things to move them.
Answer: (×)
Correction: We cannot see the wind force with the naked eye, we only see its effect on moving objects.

4. When making a car that operates by wind power, what happens when: The fan is adjusted to high speed?
Model Answer:
The car moves with great speed and covers a long distance due to the increase in the generated wind pushing force.

5. Compare between: the effect of (strong winds) and (weak winds) on the motion of the same body in terms of: (Distance traveled, Magnitude of acting force):

Point of Comparison	Strong Winds	Weak Winds
- Distance Traveled:	Longer distance	Shorter distance
- Magnitude of Force:	Greater force	Smaller force

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Groups B & C) | Application of Balanced Forces

Group (B)

1. Choose the correct answer:

The influence that causes objects to move or stop is known as:

(Distance / Volume / **Force**)

2. Complete the following statement:

The more the surface area of the sail exposed to the wind increases, the **more the amount of caught air increases, which increases the pushing force and the distance traveled.**

3. Write True (✓) or False (×):

The boat with the larger sail covers a shorter distance when the same wind blows compared to the boat with the smaller sail.

Answer: (×)

Correction: Covers a longer distance.

4. When making a car that operates by wind power, what happens when: The fan is adjusted to low speed?

Model Answer: The car moves very slowly and covers a short distance because the wind pushing force is weak.

5. Give reasons: Fishing boats in the Nile River have large sails installed on them.

Model Answer: To catch the maximum possible amount of the light winds available in the river, providing the boat with sufficient pushing force to move and cover long distances.

Group (C)

1. Choose the correct answer:

If the car with the larger sail moved a distance of 2 meters and 35 cm, it is expected that the car with the smaller sail will move a distance of .....

(3 meters and 55 cm / 2 meters and 35 cm / 3 meters 10 cm / **meter and 35 cm**)

2. Complete the following statement:

As the force of the wind acting on the sailboat increases, the **speed of the sailboat increases and it covers a longer distance.**

3. Write True (✓) or False (×):

We can clearly see the force of the wind with the naked eye as it touches things to move them.

Answer: (×)

Correction: We cannot see the wind force with the naked eye, we only see its effect on moving objects.

4. When making a car that operates by wind power, what happens when: The fan is adjusted to high speed?

Model Answer: The car moves with great speed and covers a long distance due to the increase in the generated wind pushing force.

5. Compare between: the effect of (strong winds) and (weak winds) on the motion of the same body in terms of: (Distance traveled, Magnitude of acting force):

Point of Comparison	Strong Winds	Weak Winds
- Distance Traveled:	Longer distance	Shorter distance
- Magnitude of Force:	Greater force	Smaller force

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

First: Class Activity (Discover the Secret of Rubber-Band Car)

Design a car powered by a rubber band to launch it to the furthest possible distance. To build a launch platform, fix a rubber band to the hook well, then pull the band backwards to release it.

[Project Illustration]:
A small red toy car equipped with a front hook, attached to a stretched rubber band fixed to a rigid vertical post acting as a launcher platform graded in centimeters.

Record the data in the following table:

Launch Attempt	Stretching Distance of Band	Distance Traveled by Car
First	5 cm	50 cm
Second	10 cm	100 cm
Third	15 cm	150 cm

Second: Homework Assignments

First: What happens when:

1. Straining/stretching of the rubber band is increased.
   Model Answer: The stored potential energy increases, thereby increasing the propulsion force and the distance traveled by the car upon release.
2. Releasing the rubber band.
   Model Answer: The stored potential energy in the rubber band is transformed directly into kinetic energy that propels the car forward rapidly.

Second: Correct the underlined words in the following sentences:

1. When increasing the number of rubber bands, it needs <u>less force</u> to stretch it to a certain distance.
   Correction: more force
2. When increasing the stretching distance of the rubber band, the body travels a <u>shorter distance</u> after releasing it.
   Correction: longer distance

Third: What is the effect of removing the stretching force acting on a stretched rubber band?

Model Answer: The rubber band returns to its original natural shape and size (relaxation state), and the stored potential energy is completely released.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Groups A & B)

Group (A)

First: Complete the following sentences:

1. The distance traveled by a projectile launched from a rubber launcher depends on the amount of **stretching (pulling)** of the band backwards.

Second: Correct the underlined words in the following sentences:

1. To make the car move a longer distance, we use a smaller number of rubber bands.

   Correction: "larger number"

2. The more we stretch the rubber band, the less force it exerts on bodies.

   Correction: "more force (greater force)"

Third: What happens when:

- Using a very weak and thin rubber band instead of a thick and strong rubber band in a ball launcher toy?

  Model Answer: "It stores less potential energy, resulting in a weak propulsion force, so the balls travel a very short distance."

Group (B)

First: Complete the following sentences:

1. The more the rubber band is stretched, the **more potential energy is stored** in it **and the greater the distance traveled by the car** .

Second: What happens to the body when the rubber band is left (released) after stretching?

Model Answer: "It launches forward rapidly due to the conversion of stored potential energy into kinetic energy."

Third: Correct the underlined words in the following sentences:

1. The flight distance of a ball thrown by rubber increases as the stretching distance of the band backwards decreases.

   Correction: "increases"

Fourth: Give reasons:

- Why does a car move faster when using four rubber bands instead of only one?

  Model Answer: "Because a larger number of rubber bands increases the stored potential energy, producing a much greater propulsion force that increases the car's speed."

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Group C)

Group (C)

First: Complete the following sentences:

1. The more the number of rubber bands increases, the greater the rubber's pushing force on bodies, and the greater the generated kinetic energy and distance traveled

Second: Correct the underlined words in the following sentences:

1. When leaving the rubber band on the table without any stretching, it produces a great force.

   Correction: zero force (no force)

2. The force resulting from the rubber band increases when it is relaxed.

   Correction: stretched

Third: Read the situation carefully, then determine what happens when:

- Placing a light cotton ball in front of a rubber band, then pulling the band backwards for a large distance and releasing it suddenly?

  Model Answer: The cotton ball flies and launches at high speed to the furthest distance possible, due to the massive force generated from converting stored potential energy into kinetic energy.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

First: Class Activity: Water Race Between Clay and Sand?

* **Collaborate with your group members to perform the following observations and record your conclusions to compare Clay Soil and Sandy Soil:**

[Water Race Experiment Description]:
Two transparent, perforated plastic cups are fixed as funnels over two transparent catching glass jars. The left cup contains light-yellow sandy soil labeled (تربة رملية / SANDY SOIL), while the right cup contains dark-brown clay soil labeled (تربة طينية / CLAY SOIL). Blue-colored water is poured at the exact same moment from two transparent glass beakers into both cups to demonstrate the water race and drainage speed.

1. Place two perforated cups (one with sandy soil and the other with clay soil) over two empty transparent catch jars.
2. Pour water at the exact same moment into both sandy soil and clay soil.
3. Observe carefully and measure the drainage time, then answer the following questions:

1. Which of the two soils drains water faster?
Model Answer: Sandy soil (drains water very rapidly)

2. Explain your answer?
Model Answer: Because sandy soil consists of large, coarse particles with large and wide spaces (pores) between them, which allows water to flow through quickly and easily. Meanwhile, clay soil consists of extremely small, fine particles that are tightly packed together, making the spaces between them very narrow and tight, which obstructs and slows down water movement.

3. Compare the features of clay soil and sandy soil:

Comparison Feature	Clay Soil	Sandy Soil
Particle Size	Very small and fine	Large and coarse
Spaces Between Particles	Very small and narrow	Large and wide
Water Retention Capacity	Very high	Weak and low

D.M.RAZK
موقع الدكتور محمد رزق معلم الكيمياء التعليمي

◆◆ Second: Homework Assignment & Third: Weekly Assessment (Group A - Part 1) ◆◆

Second: Homework Assignment

1 Complete the following statement:
Sandy soil is characterized by large spaces between its particles, therefore the particle size is large (coarse).

2 Explain the statement:
Sandy land dries very quickly even after heavy rainfall.
Model Answer: Because the spaces between its particles are large and wide, and its capacity to retain water is extremely weak, which causes water to drain downwards very rapidly leaving the soil dry.

3 Answer the following question:
What are the characteristics of Nile River silt that enable it to retain water for a long time?
Model Answer: Nile River silt is characterized by extremely small, fine, and tightly packed particles, which makes the spaces and pores between its particles very narrow and tiny, preventing water leakage and increasing its water retention capacity.

4 What happens if:
Heavy rain fell over soil with very fine particles and very small spaces between them?
Model Answer: Water drains downwards very slowly, the soil retains a massive amount of water for a long time, and water may accumulate on the surface forming puddles due to slow permeability.

5 Compare between: Sandy soil and clay soil in terms of: (Particle Size).
- Clay Soil: Very small and fine particles.
- Sandy Soil: Large and coarse particles.

Third: Weekly Assessment - Group (A)

1 Complete the following statement:
Water drains very slowly in clay soil because its particles are very small (fine) and the spaces between them are very small.

2 Give the scientific reason:
Nile River silt is considered suitable and ideal for agriculture in the Egyptian environment.
Model Answer: Because it is highly rich in essential organic nutrients required for plant growth, and has an outstanding ability to retain water and moisture needed by crops.

3 Answer the following question:
Mention an example of soil with large particles.
Model Answer: Sandy soil (such as desert sand).

4 What happens if:
We tried to farm in the desert without using special and advanced techniques to conserve water?
Model Answer: Farming would fail and plants would quickly dry up and die, because sandy desert soil drains water extremely fast and cannot retain moisture, leading to the rapid loss of irrigation water.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment Continued (Group A - Part 2) & Group (B)

Weekly Assessment - Group (A) [Continued]

(5) Compare between: Sandy soil and clay soil in terms of: (Water drainage speed).

- **Clay Soil:** Very slow
- **Sandy Soil:** Very fast

Weekly Assessment - Group (B)

(1) Complete the following statement:

The speed of water drainage into the soil depends on the size of the **particles** that the soil is composed of.

(2) Give the reason:

Difficulty of water passing through clay soil particles.

Model Answer: Because clay soil particles are very small and tightly packed together, making the pores and gaps between them extremely narrow and tight, which obstructs water movement and prevents it from flowing easily.

(3) Answer the following question:

Why do the spaces through which water passes inside sandy soil differ from clay soil?

Model Answer: Because of the difference in particle sizes; sandy soil consists of large, coarse, and spaced-out particles leaving wide pores, whereas clay soil consists of tiny, tightly packed particles leaving very small and narrow pores.

(4) Compare between: Desert sand and Nile River silt in terms of:
(Ability to retain nutrients dissolved in water).

Nile River Silt	Desert Sand
Very high capacity (holds nutrients firmly due to tight structure and narrow spacing of silt particles)	Very weak capacity (dissolved nutrients drain away rapidly with water due to large spaces)

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Weekly Assessment (Group C)

Weekly Assessment - Group (C)

(1) Complete the following statement:

An example of soil with small particles is **clay soil (Nile River silt).**

(2) Give the reason:

When farming in the Egyptian desert, farmers are forced to use advanced and modern methods to conserve water.

Model Answer: Because desert sandy soil consists of large particles and wide spaces that cause irrigation water to drain downwards extremely fast without retention, necessitating modern methods (such as drip irrigation or mulching) to conserve water.

(3) Answer the following question:

How does the tight packing of soil particles affect the spaces between them?

Model Answer: It significantly reduces the size of the spaces (pores) between them and makes them extremely narrow, which holds water molecules tightly and prevents water from draining easily.

(4) What happens if:

Equal amounts of water were poured at the exact same moment over two cups, one containing sand and the other containing clay?

Model Answer: Water drains extremely fast through the sand cup and collects in the catch jar below due to wide spaces, whereas water drains very slowly in the clay cup, and the clay retains most of the water inside it due to its small, packed particles.

(5) Compare between: Sandy soil and clay soil in terms of:

(Particle size and spaces between particles)

Comparison Feature	Clay Soil	Sandy Soil
Particle Size	Very small and fine	Large and coarse
Spaces Between Particles	Very small and narrow	Large and wide

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

First Question

Question 1: Complete the sentences, Give reasons, and Part-Function Table

A Complete the following sentences with scientifically appropriate terms:

1. Placing living organisms that have similar characteristics into groups is called **Classification**.
2. The active stage that hatches from the butterfly's egg and feeds hungrily on leaves is called the **Larva** stage.
3. The feet of the Fennec fox are characterized by having **thick fur** to protect them from hot sand and to help in silent movement.
4. Most desert animals are active **at night** to avoid extremely high temperatures during the day.
5. The Luffa plant lives in an environment with **fresh** water and **moist** soil.

B Give reasons (Explain) for the following:

1. Seeds do not need sunlight during the early stages of germination (when they are buried under the soil surface).
   Model Answer: Because they rely on the food stored inside the seed (cotyledons) to sprout the embryo, and they do not perform photosynthesis due to the absence of true leaves at this stage.
2. The importance of using a magnifying glass while examining the surrounding environment.
   Model Answer: To see microorganisms, tiny details, and precise parts of plants and insects clearly and accurately.
3. Camels store a large amount of water at once.
   Model Answer: To be able to survive and withstand thirst and extreme drought for long periods in their harsh, dry desert environment.

C Complete the following table:

Organism's Part	Importance
Large ears of Fennec fox	- Cools its body and loses extra heat - Hears weak sounds to hunt prey
Jerboa's hind legs	- Jumps long distances to escape preys - Prevents sinking into the hot sand

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Question 2 & 3: Correct, What happens, Choose, and Comparison

Second Question

A) Correct the underlined words in the following sentences:

1. The part that fixes the plant in the soil is called the bud. → **Root**
2. The seed of the corn plant is large and has white and black stripes. → **Sunflower**
3. The body of a bee consists of 4 parts. → **3 parts (Head, Thorax, and Abdomen)**
4. The jerboa has thick fur on the soles of its feet. → **Thick hair**
5. The camel lives in the Nile River environment. → **Desert / Desert environment**

B) Read the following real-life cases carefully and determine what happens:

1. **If a plant seed is placed in soil and provided with water.**
   Model Answer: It absorbs water and swells, then the radicle grows downwards for anchorage, and the stem grows upwards to sprout into a new plant.
2. **If the 'larva' stage is absent from the life cycle of a butterfly.**
   Model Answer: The butterfly's life cycle will not be complete, and it cannot grow and reach the pupa stage, leading to death and zero reproduction.
3. **If the Fennec fox's ears were small in size.**
   Model Answer: It would not be able to cool its body efficiently or lose extra heat, and it would fail to hear the faint sounds of its prey to hunt them.
4. **If the move a frog that lives in a river to the desert.**
   Model Answer: It would not be able to live or breathe due to the absence of the humidity and water required for its moist skin, and it would quickly dry out and die.

Third Question

A) Choose the correct answer:

1. **Which of the following represents the correct sequence of stages in a butterfly's life cycle?**
   (A) Egg ← Pupa ← Larva ← Adult Butterfly
   (B) Larva ← Egg ← Pupa ← Adult Butterfly
   (C) Egg ← Larva ← Pupa ← Adult Butterfly
   (D) Pupa ← Larva ← Egg ← Adult Butterfly

B) Compare between the following:

Plant stem and Plant root (in terms of: function of each):

Plant Root	Plant Stem
Absorbs water and minerals	Transports water/minerals to leaves
Fixes the plant firmly in soil	Supports leaves, branches, flowers

C) Explain: Some desert plants have small-sized leaves.

Model Answer: To reduce water loss through transpiration and conserve water in their dry desert environment.

D) When is the best time to plant the seeds of both Broad Fava Bean and Sunflower?

- Broad Fava Bean plant: In Winter (since it is a winter crop)
- Sunflower plant: In Summer (since it is a summer crop)

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Question 4: Complete with numbers, definitions, and importance of organisms

Fourth Question

A) Complete the following sentences with the correct numbers:

1. The number of leaves that sprout directly upon the germination of a fava bean seed is
   2 (two seed leaves / cotyledons).
2. The number of legs a butterfly has is
   6 legs (3 pairs of jointed legs).
3. The number of stages in a bee's life cycle is
   4 stages (Egg ↔ Larva ↔ Pupa ↔ Adult Bee).

B) Define each of the following:

1. Larva:
   Model Answer: It is the active stage that hatches from insect eggs (such as a butterfly) and feeds hungrily on leaves to grow and prepare for the next stage.
2. Habitat (Mowtan):
   Model Answer: It is the place or natural environment where an organism lives, which provides all its basic needs like food, water, shelter, and a suitable climate to survive and reproduce.
3. Seed Leaves (Cotyledons):
   Model Answer: They are the first leaves (cotyledons) that appear when a seed germinates, storing initial food needed for the growth of the young plant embryo.

C) What is the importance of:

1. Adaptation for living organisms:
   Model Answer: It helps living organisms survive, grow, and reproduce successfully in their natural environments, and resist harsh climates or dangers.
2. The molting process for a butterfly larva:
   Model Answer: It allows the larva to shed its old, tight outer skin and replace it with a new, flexible one to accommodate its rapid growth and increase in size.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

First: Complete the following sentences | Properties of Light & Sound Phenomenon

Monthly Test 2 - First: Complete the Sentences

1. An object that emits its own light, such as the Sun and lamps, is called a **Light Source** .

2. Shiny and smooth surfaces reflect light regularly in **One Direction** .

3. Sunlight travels in a **Straight** line unless an object blocks its path.

4. When sunlight is gathered into a single point using a magnifying glass, the spot becomes **Hotter and Brighter** and its **Temperature** rises.

5. Shadows always form in the **Opposite** direction of the light source.

6. The Sun, the object, and the shadow are always on the **Same Straight Line** .

7. A **Sundial** is used to tell time based on the regular movement of shadows.

8. Ground in sunny areas is **Warmer** , while in shaded areas it is cooler and more **Humid (Moist)** .

9. When an object vibrates, it **Produces Sound** , and when this vibration stops, the **Sound** stops.

10. When the amount of vibration of an object increases, the **Intensity (Volume)** of the sound increases and the sound becomes **Louder and Stronger** .

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

التدريب الشهري الثاني

Second: Correct the underlined words | **Third:** Give reasons (1-4)

Second: Correct the Underlined Words:

1	Rough surfaces reflect light regularly in one direction.	→ Correction: Shiny and Smooth (Polished)
2	Light reflected from a mirror travels in a curved line.	→ Correction: Straight
3	The greater the area of the gathered light point using a magnifying glass, the higher its temperature rises.	→ Correction: Smaller the area (concentrated point)
4	The shadow forms in the same direction of the light source.	→ Correction: Opposite direction
5	Shadows of objects are very long at noon when the Sun is high.	→ Correction: Very short (at their minimum)
6	A white paper heats up faster than black paper when sunlight is gathered on it.	→ Correction: Black
7	When the vibration stops, the sound continues.	→ Correction: Stops (Disappears)
8	When plucking a rubber band gently, a loud sound is produced and it vibrates with a large motion.	→ Correction: Strongly (with force)
9	Sound travels through a string telephone better when the string is slack.	→ Correction: Tightly stretched

Third: Give Reasons:

1. A black paper burns when sunlight is gathered on it using a magnifying glass.
   Model Answer: Because the black color absorbs all sunlight falling on it. When the magnifying glass concentrates this light into a single point, the light energy transforms into a massive heat energy that burns the paper.

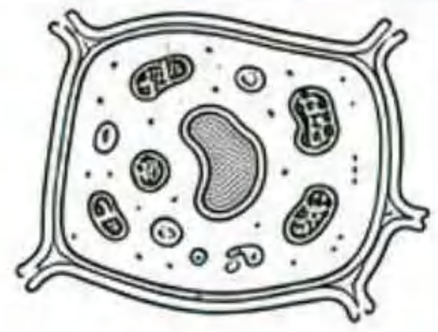
2. The shadow of a stick is short at noon but long in the morning and evening.
   Model Answer: Because at noon, the Sun's position in the sky is high (nearly vertical) which makes the shadow short, whereas in the morning and evening the Sun is low and at a slanted angle, making the shadow long.

3. Ground in sunny areas is warmer than ground in shaded areas.
   Model Answer: Because sunny areas receive direct solar radiation carrying light and heat energy which the ground absorbs, while shaded areas have objects blocking this radiation.

4. Musical instruments produce sound when they are plucked or struck.
   Model Answer: Because plucking or striking creates a vibration in the instrument's strings or membranes, and this vibration travels through the air as sound waves to our ears.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

التدريب الشهري الثاني



Third Continued: Give reasons | Fourth: What happens in the following cases?

Third Continued: Give Reasons:

6 Sound is cut off immediately in a string telephone if the string is tightly held from the middle.

Model Answer: Because holding the string tightly stops its vibration. Since sound requires vibration to be produced and transmitted, stopping the vibration stops the sound immediately.

Fourth: What happens in the following cases?

1 When the Sun moves from East to West (with respect to the direction of the shadow)?

Model Answer: The shadow moves in the opposite direction of the Sun's apparent movement (from West to East).

2 When a shaded area transforms into a sunny area (with respect to ground temperature and humidity)?

Model Answer: The ground temperature rises and its humidity decreases (it becomes warmer and drier).

3 When some powder or water spray is scattered in the path of reflected light?

Model Answer: The path of the reflected light becomes clearly visible because the powder particles or water droplets reflect and scatter the light, revealing its path to the eye.

4 When an object begins to vibrate and produce sound (with respect to the air surrounding the object)?

Model Answer: The air particles surrounding the object vibrate and transmit the sound waves in the form of compressions and rarefactions until they reach the ear.

5 When striking a drum or a musical triangle strongly (with respect to the amount of vibration and sound intensity)?

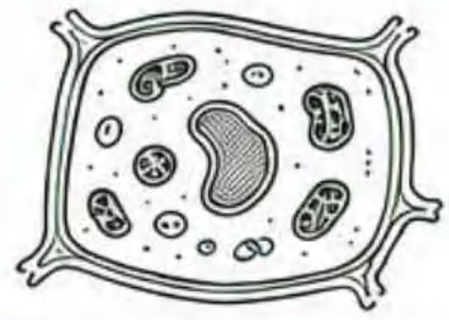
Model Answer: The amount of membrane vibration (amplitude) increases, which increases the sound intensity, making the sound louder and stronger.

6 When the string is tightly stretched between the two cups in a string telephone (with respect to sound intensity in the telephone)?

Model Answer: The sound intensity increases and the sound becomes very clear and strong because the tightly stretched string transmits sound vibrations with high efficiency.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

التدريب الشهري الثاني



Fifth: Answer the following questions | Advanced Thinking & Understanding

1 State three safety precautions that must be followed when conducting the experiment of gathering sunlight using a magnifying glass.

1- Avoid looking directly at the Sun (whether with the naked eye or through the lens) to prevent retina damage.
2- Do not focus the gathered light point onto skin or hands to avoid severe thermal burns.
3- Do not leave the magnifying glass focused on flammable materials without supervision.

2 Explain how shadows form.

Shadows form when an opaque object blocks the path of light rays. The object absorbs or reflects the light, preventing it from passing through, which creates a dark area behind the object that takes its outline shape.

3 Talk about the concept of a sundial, and how shadow movements are used to estimate time.

The sundial works based on the apparent motion of the Sun across the sky, which causes the shadow of a central pin to constantly change in length and direction. By graduating the surrounding area, we can read the approximate time by tracking the shadow's position on the scale.

4 Compare sunny ground and shaded ground in terms of: temperature, humidity level, and the reason.

Comparison Item	Sunny Ground	Shaded Ground
Temperature	High (Warmer)	Low (Cooler)
Humidity Level	Low (Dry)	High (Moist/Humid)
The Reason	Direct absorption of solar rays.	Blocking of solar rays and heat.

5 How does sound travel from its source to the human ear? Explain, showing the role of air vibration.

When a sound source vibrates, it transfers sound energy to surrounding air particles, making them vibrate back and forth in place. These vibrations pass from one air particle to the next as a wave of compressions and rarefactions until they reach the ear and vibrate the eardrum.

6 Based on how a simple string telephone is made, state only two points that make the sound reaching your ear clearer.

1- Ensure the string is tightly stretched with zero slack.
2- Keep the string completely free from touching any external objects or fingers to prevent damping the vibrations.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Monthly Test 3

First: Complete the Following Statements

1. Force is an influence that causes a stationary body to move, stops a moving body, or changes its direction of motion.
2. The larger the force, the greater (stronger) its effect on the body.
3. When a strong wind blows on a wind-powered car, the car travels a longer (greater) distance compared to weak winds.
4. As the surface area of the sail that catches the wind increases, the force exerted by the wind on it increases at a constant wind strength.
5. The rubber band possesses a property that makes it return to its original shape after being stretched.
6. When the number of rubber bands increases, the forces resulting from each band returning to its original shape increase.
7. The speed of water infiltration into the soil depends on the grain size of which the soil is composed.
8. Water infiltrates slowly in clay soil because its particles are small and close together.
9. The ancient Egyptians sprinkled water on the sand in front of the sled to make the surface more slippery when moving statues.

Second: Correct the Following Statements

1. The smaller the force acting on the body, the larger its effect.

   Corrected Statement:
   The smaller the force acting on the body, the smaller its effect
   (or: The larger the force, the larger its effect)

2. When the surface area of the sail is decreased, the force resulting from the wind increases.

   Corrected Statement:
   When the surface area of the sail is decreased, the force resulting from the wind decreases
   (or: When the surface area is increased, the force increases)

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Second: Continued - Correct the Following Statements

3 The distance traveled by a wind-powered car is constant and does not change with the change in wind strength.

Corrected Statement:
changes with the change in wind strength
(increases as wind strength increases)

4 The rubber band produces force when it is loose and not stretched.

Corrected Statement:
when it is stretched

5 As the number of rubber bands increases, the distance traveled by the car decreases.

Corrected Statement:
the distance traveled by the carincreases

6 Sandy soil is characterized by having very small spaces between its particles.

Corrected Statement:
very large spaces

7 Water infiltrates into the silt of the Nile River faster than the desert sands.

Corrected Statement:
slower than

8 When using 3 rubber bands, the power to move the car is weaker than using a single band.

Corrected Statement:
stronger than

Third: Give Scientific Reasons For Each

1 The wind-powered car travels a longer distance when the wind is strong?

Scientific Reason:
Because strong winds exert a greater force on the car,
increasing its speed of motion and causing it to cover a longer distance.

2 A sailboat with a large sail travels a longer distance than a boat with a small sail when exposed to the same wind?

Scientific Reason:
Because the large sail captures a larger amount of wind energy,
which produces a greater propulsion force to move it further.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Third: Continued - Give Scientific Reasons

3. The car rushes forward when the stretched rubber band is released?
Scientific Reason:
Due to the release of the potential energy stored in the stretched rubber band, converting it into kinetic energy that drives the car forward.

4. The distance traveled by the car increases when using two rubber bands instead of one stretched to the same length?
Scientific Reason:
Because increasing the number of rubber bands increases the resulting force and propulsion torque, increasing the kinetic energy and distance traveled.

5. Water drains very quickly in sandy soil?
Scientific Reason:
Because sandy soil particles are large and spaced far apart, leaving very large pore spaces that allow water to pass rapidly and easily.

6. Nile River silt retains water for a long time, and water drains through it very slowly?
Scientific Reason:
Because its particles are extremely small and very tightly packed together, creating tiny pore spaces that trap water and hinder its drainage.

7. Nile River silt is highly suitable for agriculture?
Scientific Reason:
Because of its excellent ability to retain water for long periods and its richness in organic nutrients and minerals essential for plant growth.

8. Ancient Egyptians sprinkled water on the sand in front of the sled when moving massive statues?
Scientific Reason:
To reduce the frictional force between the heavy sled and the sand, making the surface slippery and facilitating smooth dragging.

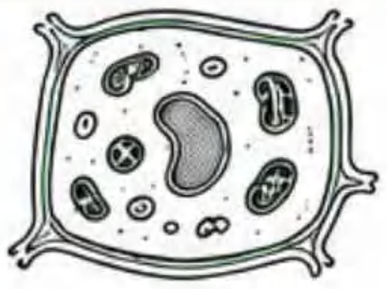
Fourth: What Happens If

1. If the speed of a fan is increased from low to high with respect to the distance covered by a wind-powered car?
Model Answer:
The wind force acting on the car increases, which increases its kinetic energy and causes it to travel a longer distance.

2. To the force acting on the car if the sail is completely removed while it is exposed to the wind?
Model Answer:
The propulsion force is almost completely lost, and the car stops moving because there is no sail to capture the wind.

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

Fourth: Continued - What Happens If



3 To the distance traveled by a rubber-powered car when the stretch length of the rubber band is increased from 5 cm to 15 cm?

Model Answer:
The stored potential energy increases, which converts into greater kinetic energy when released, causing the car to travel a much longer distance.

4 To the force produced by the rubber band after it completely returns to its original, unstretched shape?

Model Answer:
The force produced becomes zero (completely vanishes) because the tension and stretching of the rubber band are gone.

5 To the force acting on the car when using 3 rubber bands together instead of a single band stretched to the same length?

Model Answer:
The force acting on the car increases to nearly three times, increasing its kinetic energy, speed, and distance covered.

6 When a quantity of water is poured onto a soil with large particles?

Model Answer:
Water drains and passes through it extremely fast and easily due to the large spaces and far-apart particles (similar to Sandy Soil).

7 When a quantity of water is poured onto clayey soil with fine particles (like Nile silt)?

Model Answer:
Water drains through it extremely slowly, and the soil retains most of the water due to its very small spaces and packed particles.

8 To the force required to move a heavy body if the surface beneath it is made more slippery?

Model Answer:
The force required to move it decreases significantly because the frictional force with the surface is weakened.

Fifth: Compare between Sandy Soil and Clayey Soil from the aspects of: Grain Size, Spaces, and Drainage.

Aspect of Comparison	Sandy Soil	Clayey Soil
Grain Size	- Large sized	- Very small and fine
Pore Spaces	- Wide and large	- Narrow and very small
Water Drainage	- Very fast (Rapid)	- Very slow

D.M.RAZK موقع الدكتور محمد رزق معلم الكيمياء التعليمي

موقع الدكتور محمد رزق التعليمي

امسح الباركود بالموبيل لتثبيت التطبيق وتحميل كل الملازم مجانا وبسرعه

MR

حمل التطبيق الأن

GET IT ON Google Play

ملازم ابتدائي | ملازم اعدادي | ملازم ثانـــوي | كورسات ونتائج امتحانات

موقع الدكتور محمد رزق
Dr.MoRizK